Agricultural Research Institute
PUSA

A SURE SHIELD

"DAYS'"

ANIMAL MEDICINES

BLACK DRINK

CURES COLIC OR GRIPES INSTANTANEOUSLY. UNEQUALLED FOR SHIVERING FITS AND CHILLS IN HORSES AND CATTLE; FOR HOVEN OR BLOWN CATTLE AND SHEEP. A MAGNIFICENT TONIC. 24/- PER DOZ. BOTTLES; 13/- HALF-DOZEN.

RED DRINK

FOR INDIGESTION IN CATTLE, LOSS OF CUD, COSTIVENESS, HIDEBOUND, FALLING-OFF IN MILK, GARGET, RED WATER, FEVERISHNESS. GIVE A RED DRINK BEFORE AND AFTER CALVING. PACKETS–16/- PER DOZEN; CANISTERS–28/- AND 55/-

ZOMO-SAL

THE GREAT SALINE BLOOD TONIC FOR ALL HORSES AND BEASTS. BLOOD PURIFYING, TISSUE BUILDING, BONE FORMING. FOR ANÆMIA, HEAT LUMPS, ITCHY MANE AND TAIL, GREASY TENDENCY, DIGESTIVE TROUBLES, STARING COAT, OFF APPETITE IT BUILDS BONNIE FOALS. CANISTERS–10/6, 28/- AND 60/-

HUSKOLEIN

FOR HUSK AND HOOSE IN CALVES, LAMBS AND OLDER STOCK. FOR TAPEWORM, DIARRHŒA FROM WORMS, "LAMB DISEASE," SMALL RED WORMS IN SHEEP AND LAMBS, FOR HUSKY PIGS. NO SINGLE ANIMAL NEED BE LOST IF DAYS' HUSKOLEIN IS USED.

9/- PER LARGE BOTTLE. 5 FOR 42/6, 12 FOR 95/-.

DAYS' OILS

PURIFIED DRIFFIELD OILS FOR ALL KICKS, CUTS, WOUNDS, SADDLE GALLS, SORE SHOULDERS, CRACKED HEELS, SORE TEATS, SWOLLEN UDDERS, AND AS A LAMBING AND CALVING OIL.

WHITE OILS FOR ALL STRAINS, SPRAINS, SORE THROAT, RHEUMATISM, WIND GALLS, CAPPED HOCK, CURB.

EITHER OF ABOVE 3/6 AND 8/6 PER BOTTLE.

DAY & SONS, CREWE, LTD.

CREWE.

BRITISH BASIC SLAG

(ALBERTS' SUCCESSORS) LTD.

Mr. F. J. Lloyd, speaking at a Meeting of the Central and Associated Chambers of Agriculture in London on 31st January 1922, stated ;—

> "Scientific men do not know the exact nature of the phosphate present in
> BASIC SLAG
> but they do know it has quite a peculiar and extraordinary effect upon growth. NO OTHER PHOSPHATE HAS THE SAME EFFECT."

The Pioneer of Ground Basic Slag in this Country is the

"ALBERT" BRAND

which has the largest production.

For Quotations (Wholesale only) and other information apply to—

BRITISH BASIC SLAG (Alberts' Successors), LTD.

Telegrams : Fosfobasik Bilgate, London. **15, Philpot Lane, London, E.C.3.**

WORKS :

Middlesbrough.
South Bank
Wednesbury
Frodingham.
Brymbo
Etruria
Cradley.
Hollinswood
Park Gate (Yorks).
Hawarden Bridge.

JOURNAL

OF THE

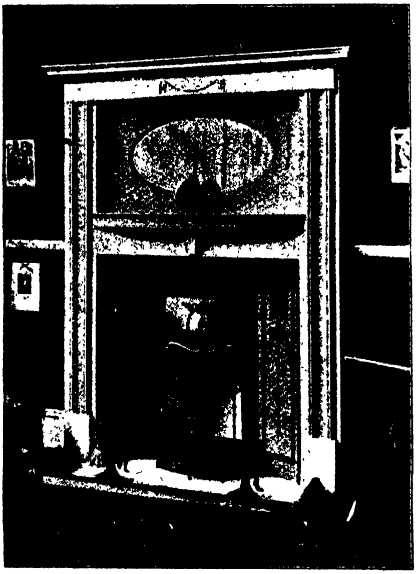
BATH AND WEST AND SOUTHERN COUNTIES SOCIETY.

GARDINER, SONS & Co., Ltd.

Telephone:
No 5640 Private Branch Exchange.

Telegraphic Address:
"GARDSONS, BRISTOL."

Nelson Street,
BRISTOL.



GAS, ACETYLENE and
ELECTRIC LIGHT
FITTINGS.

◆

CHIMNEY PIECES,
GRATES and FENDERS.

◆

FURNISHING
IRONMONGERY.

◆

SHOWROOMS contain one of the
LARGEST SELECTIONS
in the KINGDOM.

Inspection Invited.

KITCHEN RANGES and
COOKING APPLIANCES
of every description.

◆

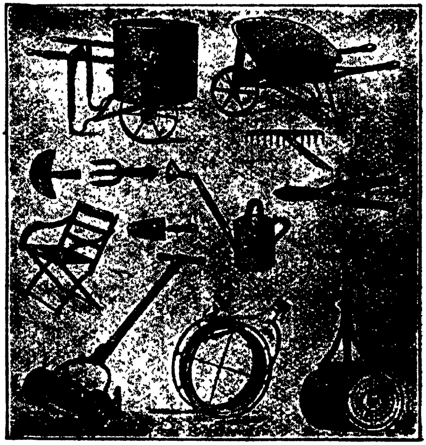
BATHS and
LAVATORY FITTINGS.

◆

GARDEN REQUISITES
of every description.

◆

LAWN MOWERS
of all the leading makes.



Illustrated Price Lists on receipt of requirements.

JOURNAL

24. APL 1922

OF THE

BATH AND WEST AND SOUTHERN COUNTIES SOCIETY

FOR THE

ENCOURAGEMENT OF

AGRICULTURE, ARTS, MANUFACTURES AND COMMERCE.

ESTABLISHED 1777.

FIFTH SERIES.

VOL. XVI.

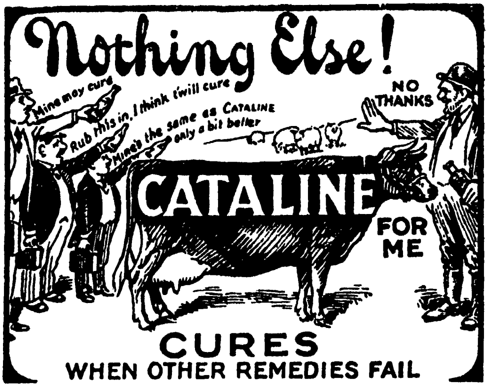
1921-1922.

WORK AND LEARN.

LONDON:
EDWARD STANFORD, Ld., 12 to 14, LONG ACRE, W.C.2.
1922.

[*All rights reserved.*

Price to Non-Members Six Shillings and Ninepence.



Our Farming Customers are Our Best Advertisers

They are constantly sending "catch phrases." One week we get a letter from a Shepherd **swearing Cataline to be worth £5 per bottle!** Another week from a large **Dairy Farmer** it was: **"Cataline is the World's greatest Cow Drench!"** Another writes: **"Cataline is a great blessing."** And this week it is. **"Nothing else!" And that clinches it.** ***Here you are:—***

"Plaistow, Billinghurst, Sussex. Please forward at once 6 Bottles of Cataline. I am urgently wanting same for a cow, **and nothing else** can take the place of **Cataline.**—Yours truly, H. Jewson."

What about You?

Are you still being persuaded into "something quite as good" or "the same thing" as **Cataline?** The plain English to that is "It's not true." There is no other drench that cures udder troubles like **Cataline!** It goes to the root of the trouble and does not purge or weaken the animal. No matter how severe the inflammation in, or swollen the udder may be, a drench or two given in clean, cold water, reduces the udder to normal and renders the milk quite good without bathing or rubbing! If your drug store or trader cannot supply **Cataline,** send to the Sole Makers, **The Cataline Co., Bristol,** who will send, carriage paid, 12 bottles for 43 6, containing sufficient medicine to make 48 Cow, 96 Calf, Sheep or Pig Drenches. **"Each drench cures."** Don't wait until your animals are desperately ill, but order **now.** "One drench in time saves nine."

CATALINE

THE DRENCH THAT CURES!

CONTENTS.

VOLUME XVI.—FIFTH SERIES. 1921–1922.

ORIGINAL ARTICLES AND REPORTS.

PAGE

I. Epizootic Abortion of Bovines 1

By **Prof. J. Penberthy.**

II. The Systematic Folding of Pigs on Arable Land 22

By **A. Harbord.**

III. The Soiling System 30

By **Gervaise Turnbull.**

IV. Do Plants Exhibit Senescence ? 46

By **Prof. J. H. Priestley, D.S.O.**

V. Some Important Insect Pests of Strawberries 57

By **Herbert W. Miles, N.D.A.**

VI. Farming and Reconstruction 72

By **Prof. James Long.**

VII. The Improvement of Poor Pastures 82

VIII. The Society's Exhibition at Bristol 99

By **F. H. Storr,** Secretary.

IX. The Dairy Department at Bristol 105

By **A. F. Somerville.**

X. The Forestry Section at Bristol 117

By **Godfrey Lipscomb.**

XI. The Nature Study and Handicrafts Section at Bristol .. 121

By **H. M. Cundall, I.S.O., F.S.A.**

XII. The Exhibition of Cider at Bristol 126

By **Major E. W. Farwell.**

PAGE
XIII. Report upon the Best Managed Farm Competition, 1921 .. 129
By **Douglas T. Thring, F.S.I.**

XIV. Small Holdings Competition, 1921 134
By **A. R. White.**

XV. Bristol Champion Allotment Competition, 1921 136
By **G. W. Hollingworth and A. D. Turner.**

XVI. Annual Report upon the Society's General Operations .. 138
By **F. H Storr,** Secretary.

XVII. The National Fruit and Cider Institute 143
By **B. T. P. Barker,** Director.

XVIII. Report of the Society's Consulting Chemist 275
Dr. J. A. Voelcker, M.A., F.I.C.

APPENDIX.

BRISTOL MEETING, 1921.

Judges .. .. i-ii
Awards .. .. iii-cxv

PRIVILEGES, LAWS, OFFICERS, &c.

Objects of the Society and Privileges of Membership cxvi
Terms of Membership cxvii
General Laws .. .. cxviii-cxx
Council and Officers .. .. cxxi-cxxvi

List of Annual Exhibitions, 1852-1922 .. .. .. cxxvii-cxxix
Privileges of Analyses .. .. . cxxx-cxxxiii

PLYMOUTH MEETING, 1922.

Donors of Money Prizes .. .. cxxxiv-cxxxv
Judges and List of Prizes for Stock, Produce, etc. .. cxxxvi-clix
Conditions and Regulations for Ditto .. .. .. clx-clxx
Judges and Prizes for Poultry .. .. .. clxxi-clxxiii
Conditions and Regulations for Ditto .. .. .. clxxiv-clxxvi

PAGE

FINANCE.

Summary of Cash Account to December 31st, 1921 .. clxxviii-clxxix
Annual Cash Account .. .. clxxx-clxxxix
Assets and Liability Account cxc
Financial Result of Show cxci

List of Members .. .. cxcii-ccxxvii
INDEX ccxxviii

ILLUSTRATIONS.

Pig-folding on Arable Land (Plates I—IV) *following page 24*
Insect Pests of Strawberries ... ... *pp. 66, 67*
Apical Browning ... ... *following page 146*
Michaelmas Daisy Disease... ... ... ,, ,, *272*

JOURNAL
OF THE
BATH AND WEST AND SOUTHERN COUNTIES SOCIETY.

Original Articles and Reports.

I.—EPIZOOTIC ABORTION OF BOVINES.

By Prof. J. Penberthy.

Female mammals of all species are under a variety of circumstances liable to cast their young before expiration of the full time of gestation, and such may be attributable to many and diverse causes, but that form of abortion, now known as "Epizootic," of which cows and heifers are particularly the subjects, manifests well defined characteristics which clearly separate it from all other manifestations of the Act. The occurrence of abortion in farm animals, not attributable to the cause of the Epizootic Abortion disease probably will always take place. At times, depending on individual value of the animals concerned, or on the numbers affected, such occurrences may be responsible for serious loss to the owner in whose stock they happen, but considerable experience indicates that abortion, apart from the Epizootic, is not common and can be accepted among the minor risks of stock keeping. Even in a herd affected with Epizootic abortion cases may occur from causes other than that responsible for the prevailing disease. The malady now under review has been recognised in most civilised countries where breeding cows are kept, appearing to be more prevalent where the numbers are large and inter-communication easy. It is widely distributed on the continents of Europe, North America, Australia and New Zealand, and appears to be attracting more attention in the Argentine and South Africa. Our own herds are very extensively affected, and the loss to stockowners and the nation through its effect on the meat and milk supplies is extremely serious.. Tuberculosis, so widely spread in our cattle, and with an importance enhanced by the fact of its being communicable to man, must impose a very heavy penalty, but on account of the chronic nature of the disease its effects are not so keenly appreciated, indeed, a farmer may have tuberculosis in his herd for years and not realise that he is a loser therefrom. On this point and at the same time as evidence of the prevalence of Epizootic Abortion elsewhere, it may be permitted to quote from the last report (1920) of the Director of Animal Industry of Massachusetts, U.S.A.: "The ravages of Epizootic Abortion are well-known to everyone engaged in dairying and the breeding of thoroughbreds. The losses occasioned by it and its concurrent conditions are estimated to be second only to losses from tuberculosis." It is our personal opinion that Epizootic Abortion is the most costly and disturbing disease at present affecting the herds of the United Kingdom.

In some instances the disease is plague-like, and it is not a very uncommon experience to find that not a single living calf has been born into a herd for a whole year or more, while in other cases, with fewer actual losses of calves, the disease has persisted as a source of great loss and intense disappointment for several years. When it is realised that in some infected herds each healthy calf born alive would be worth £100 to the owner, the actual loss from his herd becoming infected may run into very large figures. It may be here remarked that Epizootic Abortion is no respector of breed or model farm conditions as generally accepted. Given the same opportunities the under-bred and the pure-bred appear equally susceptible, and it is a disease of the poor as well as the rich man's cows. The incidence of Epizootic Abortion and its prevalence are to a large extent determined by the system of maintaining the herd, that is to say, whether by rearing calves born on the farm or replacing animals removed by new purchases.

Not having been a notifiable disease in this country, there are no figures on which to base an exact opinion as to the proportion of our cows and heifers affected. There can, however, be no question as to its extensive prevalence and the consequent heavy loss to stockowners in this country.

A report of inoculation trials, carried out for the County Council of Oxfordshire on infected herds, voluntarily submitted by their owners for the experiment, indicates that about 30 per cent. of the cows of these herds had aborted in the year prior to the commencement of operations. A map of the county, appended to the report, on which is marked the situation of the farms, shows a fairly even distribution throughout the county. The report states that the herds submitted to the trials were probably only a few of those affected in the county, but even so, they represented 5 per cent. of the 23,000 cows and heifers in milk within the county of Oxfordshire. On a basis, which may or may not be sound, it was calculated that the monetary loss to stockowners in the county was about £30,000 annually. I know of no reason for assuming that the prevalence of the disease in Oxfordshire is beyond the average of other counties. Assuming the above-mentioned computation to be approximately correct, as the number of cows and heifers in milk in Great Britain is about 2,500.000, and in Oxfordshire 23.000, the total estimated loss to British stockowners exceeds £3,000,000 annually. While from the fact that at the present time about 30.000 doses of abortion vaccine are sent out yearly from the laboratory of the Ministry of Agriculture for use in affected herds it would appear that the foregoing estimate may not be very far from correct.

There is no evidence available showing whether bovine animals in the wild state contract this disease. but from the earliest written records we may gather that " casting of the young " by domesticated animals was in primitive times, when the pastoral life was general, regarded as a matter of much importance.

Biblical records not only refer to its occurrence, but the references are in such form as to lead to the inference that abortion was then a matter of serious concern ; thus in Exodus xxiii, 26, we find the promise : " There shall nothing cast their young nor be barren in thy land." Job xxi, 10, describing the temporal prosperity of the wicked, wrote : " Their bull gendereth and faileth not, their cow calveth and casteth not her young." We are, of course, not in a position to state implicitly that the " casting of the young " was Epizootic Abortion, but judging from our own experience, we think it fair to assume that a number of abortions, such as occur in our herds and flocks to-day, other than those we call Epizootic, would not invest the " casting of the young " with the serious importance which the references appear to attach to its absence. Dr. Fleming, in his " Animal Plagues," adduces evidence of the existence of Epizootic Abortion in the East in times antecedent to the Christian era.

Taking a long step to early English literature on the domesticated animals we find Mascall, in the quaint language of A.D. 1537, giving directions for "keeping cows which are big-bellied in calf." In the two subsequent centuries records containing references to disease in farm stock are, if existent, rare. By the early years of the nineteenth century, however, writing on the subject of animals and their ailments became fashionable, and though it must be admitted that while much of the production was vague and valueless there may still be found information which accrued to careful observation. In his work, published in 1804, Lawrence states: "Cows are well known to be much given to abortion, slinking or slipping their calves in an early period of gestation; it is sometimes epidemic, thus some people have supposed it to be contagious." Writing three years later, Skellett remarks, "Abortion is an accident to which cows are very liable, it has often been known to spread like an infectious disease and great losses have been suffered by cow-keepers." In 1837 Youatt wrote, "Abortion spread through dairies, and flocks and studs were often affected." In 1851 Barlow stated that "abortion of cows is of such extensive prevalence amongst large stocks of cattle as to be fairly considered an epizootic disease." Elsewhere we are informed that in 1860 "the district of Hereford abounds in abortions both in the bovine and equine species." During the next decade serious "epidemics" of abortion amongst cows, mares and ewes are recorded.

Whether it is purely a product of domestication is not a matter of great practical concern, but facts relating to the true nature of the disease, which have been recently ascertained, taken in conjunction with a knowledge of changes in the methods of dairying and breeding render it highly probable that Epizootic Abortion is as prevalent at present in the herds of the United Kingdom as ever before. Increased facilities for locomotion have made freer exchange and wider movement practicable, while probably the most potent factor is the getting rid at the earliest convenient moment of animals, which have aborted, under the impression that such were undesirable members of the breeding herd. There is no available evidence to prove that this practice of selling these dangerous cows is influenced by recognition of the contagious nature of the disease, but it would appear that the immunity acquired by a cow which has once aborted cannot have been fully realised by the owners of infected herds as being a valuable asset. While such a cow taken into a healthy herd may become the originator of the disease there the amount purchased to replace her may prove to be fuel added to the fire and help to maintain the infection.

A study of the history of abortion in cows and other domesticated animals shows that much attention has been given to speculation as to its cause, and taking into consideration the obscurity and wonder affecting the lay mind in matters relating to conception and pregnancy and the accepted views that premature expulsion of the fœtus may be due to a variety of circumstances, it is, perhaps, not surprising that the occurrence of abortion and particularly the epizootic form should have been largely attributed to mysterious influences. As a matter of fact, abortion has been put down to almost every conceivable influence which has been credited with inducing disease. Fright, sewage, poisons, mineral or vegetable, errors of diet, excess of food, starvation, heavy soils and consequent fatigue, in-and-in breeding, situation, disease and incompetence of the bull, and mechanical injury, have all had their vogue and adherents.

While none of these can be accepted as a cause of Epizootic Abortion it is not intended to assert that an occasioual abortion may not be correctly attributed to some of them. From early times witchcraft and sympathy, or some such occult influence, have been held to account for the occurrence of the unexplained and inexplicable, and in case of abortion, where any of the other reputed causes failed to fit in with the circumstances, the one or the other has been freely adopted as the cause. The goat in the cattle-shed, the burial of the abortion under its threshold, the horse shoe, killed fox or magpie nailed to its door, etc.. all point to the superstition known as witchcraft or the personal peregrinations of the Evil One or his emissaries. This reputed cause lived to a bad old age, and now is among the limbo of the past, though its obsequies are of recent date. The " sympathy " theory, which so much retarded acceptance of the true nature of Epizootic Abortion, if defunct, died a harder death, and one is disposed to think its ghost still haunts the obscure corners of some homesteads.

While the foregoing views of the cause of abortion generally obtained, the observations of the more astute and better-informed in the manifestations usually associated with epidemics, had suggested the contagious nature of abortion appearing in the form now named epizootic. Indeed, the theory of contagion had been mooted and insisted on, and in writings of the early part of the nineteenth century such views were definitely expressed by some British and foreign writers and equally clearly and forcibly rejected by others, though it is noticeable that both were equally insistent on the adoption of disinfection as the means for combatting the disease. Thus in the " Complete Farmer," published in 1807, we read : " It is certainly contagious; when it happens the abortion should be immediately buried and the cow kept as widely apart as possible from the herd and not receive the bull that goes with them." Twenty years after this Hurtrell D'arborval, a recognised continental authority, though not subscribing to the belief in contagion, writes: "It is considered by some persons Enzootic or Epizootic, because they do not know the true cause. They are not content to call it Epizootic, they also call it contagious." He then proceeds to advocate what were at the time regarded as the most scrupulous disinfecting measures, including washing out the womb, cleansing the cow sheds, etc. In an essay on abortion, to which the Royal Agricultural Society awarded a prize of £50 in 1851, Professor Barlow discusses the contagion theory and decides against it. Three years later Professor Armitage, writing in Claters' "Cattle Doctor," stated: "We are now certain that the view that abortion is contagious is an erroneous one." Both these writers, however, strongly advocate strict disinfection and isolation. Notwithstanding this marked diversity of opinion amongst those who set themselves up as authorities on the diseases of cattle, the practical experience of many observant stockowners led them to the conviction that the commonest form of abortion in cows was due to contagion. In 1862 the Rev. Holt-Beever, a well-known breeder, wrote: "There is nothing so contagious as this slipping or slinking of calf or lamb; something of this kind, apparently epidemic, occurred amongst mares in this country last year."

Up to this time experimental investigation into the causes of disease had been rarely adopted. It was, however, thoroughly realised that the discovery of the causes of such diseases as Epizootic Abortion and all information to be obtained from a study of their behaviour must constitute the basis on which means to combat and control them must be established.

In 1876, Franck, in Germany, placed portions of aborted matter from affected cows into the genital passages of healthy ones and reported that abortion followed in the previously healthy. This scientist also found varieties of microbes, but failed to demonstrate that either was the actual cause of the infection. Many foreign investigators entered the field of research about this time, but without appreciably valuable results in connection with this disease.

The first enquiry into the cause of Epizootic Abortion carried out on experimental lines in this country, was initiated by the Highland and Agricultural Society of Scotland, and commenced in 1886, by a committee of their appointment. The report of this committee appears to show that the results of their experiments confirmed those of Franck, and that five out of eight animals aborted after the insertion of infective matter into their genital passages. The committee expressed the opinion that these results, though supporting the view of contagion, did not prove it, and that further experiments were necessary.

In the same year (1886) the adoption of this theory received marked impetus from the publication of the results of Nocard's investigations into the nature of the disease, and of a method of disinfection, which had apparently proved efficacious, and promised to exert a favourable influence in suppressing it. Nocard at the same time announced his discovery of a microbe, which he regarded as the causal factor of the malady, and promised a further report, which, however, did not appear. The method of disinfection set out by Nocard was largely adopted in this country, and in many cases with apparently beneficial results, but the establishment of a specific microbe as the cause of Epizootic Abortion had not been effected.

In 1894 the Royal Agricultural Society of England appointed a Committee to enquire into abortion in cattle, by taking evidence of stockowners and others intimate with the conditions affecting the health of farm stock. This committee reported on the extensive prevalence of the disease and the serious losses therefrom, that the theory of contagion was then almost universally accepted, and that it fitted in most accurately with the facts given in evidence, but on the other hand there is no proof that the disease is one of the true contagia. They advised that a series of experiments should be undertaken with a view of settling the question. Most of the witnesses, who had adopted disinfection on the lines laid down by Nocard, appeared to be favourably impressed with its results.

The Government of the day was approached and strongly urged to undertake an exhaustive enquiry into the subject at the earliest possible moment, but this request met with the not unusual reply that the Lords of the Treasury were unable to sanction the necessary provision.

Though the last-named committee reported so definitely that the theory of contagion was then almost universally accepted, a critical study of the evidence cannot fail to convey the idea that opinion was not unanimous. Some of the witnesses who, while endorsing the view of a contagious nature of Epizootic Abortion, expressed the conviction that abortions due to other causes, mechanical or otherwise, might by some mysterious means become a source of the contagion which induces the epizootic form. Thus such a well-known authority on breeding and animal diseases as the late Mr. Clement Stephenson, in reply to a question on the point, said: "I look upon every case of abortion as capable of becoming a centre of contagious outbreak."

It may be admitted that if such an assumption were acted on in practice and every case of abortion treated as though contagious until the contrary is proved by definite means now at our disposal, it would materially lessen the risks of the spread of Epizootic Abortion. The acceptance of such a theory, which is contrary to all we know concerning the true contagia, would, however, render hopeless any attempt at elimination, and it must be discarded.

The absolute and apparently incontrovertible settlement of the vital point concerning the cause of the prevailing Epizootic Abortion of cows, accrued to investigations commenced in 1895 by Dr. Bang, in Denmark, the results of which were published in the following year. This celebrated veterinarian discovered in the womb of cows, which had recently aborted, in the aborted fœtus and its membranes (the after-birth) minute bacilli, cultures of which injected into the genital passages or the blood stream of healthy pregnant cows, mares and ewes, were followed by abortion. Further, all the conditions necessary to the acceptance of this microbe as the specific cause of the commonly occurring abortion of cows were fulfilled. This series of experiments proved that Epizootic Abortion of cows is a specific contagious disease, caused by a microbe named after its discoverer, the *abortion bacillus of Bang*, and laid the foundation for all future work directed to the control of the malady.

Further, Dr. Bang's experiments showed that this casual bacillus lived and retained its power to infect susceptible animals for a considerable time after leaving the body of the infected animal, and revealed the very important fact that healthy animals may contract the disease by taking the infective matter through the mouth with contaminated food or water, and by inoculation, as well as through the genital passages, which had been demonstrated before and had come to be regarded as the usual, if not the only channel through which infection occurred. It was also found that this bacillus may retain its vitality and virulence in the bodies of infected pregnant cows for long periods, and that it may be discovered in discharges from the vagina, which usually precedes by a few days the act of abortion, and which may continue for a month or more after it. The possibility of conferring immunity by injections of vaccines was suggested on the ground of the common observation that naturally occurring Epizootic Abortion appeared to confer on the subject a greater or lesser degree of resistance to the activities of the causal bacillus.

After careful and extensive investigation in this country the bacillus discovered by Dr. Bang, in Denmark, was accepted as the cause of the prevailing abortion in cows in the United Kingdom, and the same applies to similar occurrences in other countries where bovine abortion is prevalent. Bang had demonstrated that large doses of his virus given to pregnant ewes and mares were followed by abortion in these animals. Others have had similar results in goats and sows, but under natural conditions there is every reason for believing that the microbe responsible for the prevailing abortions in cows is not responsible for many of the outbreaks of abortion in farm animals of other species. Further, it has been placed on record that other micro-organisms. such as that sometimes causing abortion in ewes, have occasionally been responsible for outbreaks of abortion in cows in connection with which the bacillus of Bang could not be found. For all practical purposes. however, it is generally accepted that, at least in this country, the bacillus of Bang is the cause of Epizootic Abortion of cows. and must be the basis of further experimental work, the ultimate object of which is the discovery of practical measures for suppressing the disease.

The report of Bang's work and its immediate results excited widespread activity among investigators of animal disease, but it was not until 1905 that the British Board of Agriculture, after much external pressure, appointed a Departmental Committee to enquire, by means of experimental investigation, into the pathology and etiology of Epizootic Abortion. Reports of its results were published in 1909 and 1913. These documents, with their appendices, contain evidence of work of the highest order, the practical application of which has been now carried so far as to arouse the hope that the time is not far distant when measures for dealing effectually with this costly disease will be at the disposal of stockowners.

In saying so much for the activities of official workers in this country, it is realised that a considerable share of the valuable information we are now in possession of must be credited to investigators in other parts of the world, who have materially contributed to it.

We now accept the position that Epizootic Abortion of cows is a contagious disease and can only be induced in healthy animals by infection derived directly or indirectly from infected animals, which are practically always bovines, though in this respect it may be well not to ignore the fact that occasionally ewes, mares, goats and sows may be affected and discharge the virus.

After gaining entrance to the body of a susceptible pregnant animal the virus passes to the womb, multiplies on its inner surface, penetrates into the coverings of the fœtus itself, and in the majority of cases the result is death of the fœtus and its prematurely expulsion. The death of the young of infected cows is, however, not invariably accomplished, for a small proportion of such are born alive and while some die soon after birth, a few live to maturity. The essential point to fix in mind in this connection is that everything discharged from the womb of an aborting cow contains the virus, and is infective. For a day or more prior to the expulsion of the contents of the womb there is a discharge from the genital orifice, and after the act this is usually more profuse and continues in the majority of cases for two or three weeks, rarely as long as two months. It is during this period that the aborting cows may be scattering the germs about their bodies, the pastures or premises. The womb would appear to be cleansing itself and, according to some experimenters, has usually done so before the end of the second month after abortion. The necessity for destroying the virus so discharged, as a means of checking the spread of the disease, is obvious. It is doubtful whether, under ordinary circumstances, it is wise to attempt to rear the calf of an infected cow, as the virus is often found in the young animal's stomach and may get on to pastures or premises. It has, however, been observed that the living calves from infected cows, as a rule, do not show signs of infection longer than about six months after birth, so that if it be decided to rear such it would appear to be advisable to isolate until evidence of infection no longer exists. The wisdom of the legislature in placing a ban on the service of the bull within two months of her having aborted, will be equally obvious. To do so before is to court disaster by taking the risk of sowing seed on infected soil, and carrying infection to healthy cows subsequently served.

It is generally accepted that the abortion bacillus does not find conditions favourable to its growth and multiplication outside the body of a susceptible animal except in certain specially prepared laboratory media, kept under special conditions. In a liquid medium it has been found to retain its vitality and power to infect for seven months, but not for a year, while in a dry state it loses these properties in three or four months. The question often arises as to the period which should elapse before healthy animals can with safety be placed in sheds or pastures which have been occupied by aborting cows. This, perhaps, cannot be given with precision, but the idea, which once prevailed that such situations remained dangerous for periods extending to years, does not appear to be supported by extensive observation. It appears that where chemical disinfectants can be rigorously applied premises may be rendered free from contamination in a comparatively short time. Though anything, especially food and water, while contaminated with living virus, is a source of danger, nothing must be allowed to obscure the importance of the infected animal as the source of the contaminating factor.

When it is fully recognised that infection takes place through the mouth the importance of maintaining food and water free from risk of contamination will be realised. This could only be accomplished by immediate disinfection of all infective matter as it issues from the infected animal in the period before referred to. Though owing to circumstances connected with the occurrence of Epizootic Abortion this is not always practicable, it must be the objective to which the efforts of those who may attempt to control the disease by methods of disinfection should be directed.

It has been ascertained that under some conditions the abortion bacillus also passes out of infected cows in the milk. When pregnant animals receive infecting matter by whatever port of entry, the abortion bacilli pass to the womb and commence there operations, which commonly culminate in the act of abortion. In case of non-pregnant cows and maiden heifers, which become infected, the course of the bacilli is towards the udder, where they settle usually, at first, in the hind quarter. In the milk of such cows and the secretion in the teats of such maiden heifers are found abortion bacilli, but as a source of virus contributing to the origin or spread of abortion in healthy animals, facts so far ascertained do not allow us to regard the milk of cows as of high importance. Feeding with such milk has failed to infect calves. Whether this failure is due to insusceptibility of the very young or to some power possessed by the milk to destroy or weaken the bacteria has not been yet settled. It has been reported by an American bacteriologist that the milk of infected udders contains something which has a destructive and modifying effect on bacteria. Though this discovery of bacilli of abortion in milk may at present appear to be little more than of academic interest, it is a fact which cannot be wholly disregarded when considering the channels of escape.

Experimentally it has been shown that cows may be infected by inserting abortion bacilli into the milk duct of the teat. It is, of course, within the range of possibility that under natural conditions such may result from contamination with uterim discharge, but there would appear to be no evidence indicating that the teat is a common channel of infection.

To the bull, as a mechanical carrier of the contagion from diseased to healthy cows in the act of coition, varying degrees of importance have been attached. After proof of infecting animals through the genital passages and the general acceptance of the view that these were the only channels through which the infecting matter gained entrance, it is not surprising that the agency of the bull should have been regarded as one of the most important in spreading the disease. It has been demonstrated comparatively recently that by introduction of abortion bacilli into the sheath the bull may be infected and become actually affected with the disease and, further, it has been found in applying the agglutination tests to a very large number of bulls more than 5 per cent. were naturally infected. Abortion bacilli have been demonstrated in the seminal fluid, in the testicle, and other contiguous tissues. Notwithstanding these apparently incriminating circumstances experiments have been conducted in which bulls, which had recently served aborting cows, have been soon after used to clean, healthy cows which did not abort but brought forth living normal calves and gave no evidence of infection. Observations under natural conditions have led to various opinions as to the degree of danger, which must be attributed to the bull as a disseminator of the disease, but where the results of such observations have been made public they do not support the view that he is responsible for a large proportion of cases. It would, however, be unwise, probably dangerous, to unduly minimise the bull's influence. It is well known that, apart from coition semen is frequently emitted on to pastures, floors, etc., which may thus become contaminated.

After the invasion of the pregnant cow by the virus the series of events which culminate in abortion occupy periods which vary considerably. A pregnant cow may be infected before or at any stage of pregnancy, may possess a degree of resistance, natural or acquired, which is finally broken down, the dose of the infecting matter or its virulence may vary. Under natural conditions it is practically impossible to determine with anything like exactitude when an animal first receives infection, but the results of experimental infection with doses of cultured abortion bacilli appear to indicate that an average period of about four months elapses between the entrance of the virus and the act of abortion. It will thus be realised that infection may take place at a late stage of pregnancy and not be followed by the premature expulsion of the calf and its membranes, which, however, may take abortion bacilli to the outer world.

After the virus gains access to the cow evidence of her being infected or having contracted the disease may not be attainable by the tests at our disposal for two or three weeks.

A considerable proportion of cows, the subjects of Epizootic Abortion, do not abort twice consecutively, others may do so after two or three successive pregnancies, though all are subject to the same risks of contagion. It has been commonly observed in those instances in which consecutive abortions occur that each succeeding period of pregnancy is longer than the preceding. This circumstance has led to a general impression that in a large proportion of cases there is a natural tendency under certain conditions for cows to cease aborting, and it was assumed long before being proved experimentally that a greater or lesser degree of resistance or immunity was acquired from the attack as in the case of some other contagious diseases, such as that of small-pox in man. It is accepted that the great majority of cows, which have aborted, have thereby been invested with an immunity which may last for years. In any attempt to control and eventually eradicate the disease this knowledge is of the greatest value. Exercise of the activities of the abortion bacilli on the animal tissues results in the production of a substance which remains in the animal's blood to inhibit the action of virus, which, during the existence of the immunity may enter the animal. Calves and young animals are believed to enjoy a certain degree of immunity up to near the time of sexual maturity. However, it is, perhaps, important to realise that there are degrees of resistance, and that this may become weakened by circumstances and not sufficient to repell the attack of large doses of virulent bacilli, so that it seems advisable under all conditions to disinfect and destroy the virus as far as possible. In view of these facts it will be seen that in an aborting herd the cow, which has aborted and thereby become protected against attacks of the disease,is a valuable asset and should not, for reasons of her abortion, be sold in the interests of the owner. If other circumstances dictate her sale it should be for immediate slaughter only, unless after testing she is found not to be infected and free from danger to other animals with which she would come into contact, for while a cow is infected no matter whether she has actually aborted or not she may be what is recognised as a carrier. The effect of replacing cows removed from an aborting herd by healthy cows is also fraught with danger as being a means of prolonging the outbreak affording suitable soil for the virus. It is held by some that the bacilli of abortion find in the newly imported animals conditions which favour increase in their virulence. At any rate, experience indicates that where the practice of bringing fresh females into aborting herds obtains the disease tends to persist. There is no evidence available which will allow us to determine how long the immunity so acquired may last in any individual case, but accumulating experience appears to indicate that this on the average is sufficient to protect for long enough to be utilised in certain procedures now being adopted for clearing herds from the disease.

Cows infected with Epizootic Abortion rarely, if ever, yield evidence of indisposition or abnormality. It has been noted that infected heifers sometimes manifest uneasiness and some springing of the udder at about the fifth or sixth month of pregnancy. In fact, the health of the mother appears not to be appreciably affected. The earliest and most conspicuous sign of approaching abortion is usually a discharge through the vagina, which appears a short time prior to the act. This often goes unnoticed where existence of the disease is not suspected, while not infrequently no suspicion is aroused until the abortion happens to be discovered or cows return to the bull. After expulsion of the fœtus the discharge is more profuse and sometimes of a chocolate colour. usually ill-looking, but ordinarily free from disagreeable odour. This discharge usually ceases to be observable in two or three weeks, and rarely lasts as long as two months. The afterbirth is often retained, and has to be manually removed. In cases where complete removal has not been effected the nature of the discharge may be altered by the action of putrefactive germs, which have entered the womb through the genital passages, it may now become offensive in odour and persist for months. This must not, however. be regarded as due to the virus of Epizootic Abortion. but as a complication or sequel to its effects. As far as we are able to judge of the more or less permanent injury in the form of sterility of cows and certain infections said to be attributable to or to follow Epizootic Abortion then are probably the effect of other micro-organisms than the abortion bacillus.

After the discovery that Epizootic Abortion is a contagion due to a specific virus the great obstacle to designing rational measures for controlling it lay in the fact that there existed no means for determining whether an animal was or was not infected. Recognising the immense value of such agents as tuberculin and mallein in the diagnosis of tuberculosis and glanders, two diseases of a similarly chronic and obscure character, the existence of which could not be determined by ordinary clinical methods, and following up Dr. Bang's suggestion in his report of 1895, the experts of the Departmental Committee of 1905 set themselves to the task and were so far successful in preparing from abortion bacilli a material to which the name "abortin" was given. This product, though it gave a certain amount of valuable information, was not accepted as practically applicable, and its use was abandoned after a short trial and the adoption of a system of preventive inoculation.

Some years before the work of this Committee was commenced, certain tests of the blood serum of human subjects had been successfully applied to the diagnosis of their diseases. It had been demonstrated that in the course of some bacterial diseases there is something added to the blood of the affected which yields evidence of their existence under specified conditions in the laboratory. These substances, known as antibodies, are produced in the struggle between the virus and the cells of infected animals. The means devised to discover their existence in the blood are the so-called serum tests, and those in common use the "Complement" and the "Agglutination" tests. After considerable investigation it was discovered that in case of Epizootic Abortion in cows valuable information as to whether an animal was affected or not could be obtained by application of either test, indeed, so reliable are both that one of the most serious problems in connection with the control of the disease is thereby solved. Owing to the colossal amount of laboratory work which the complement test would involve in any general application it has not been brought into general use as a diagnostic agency in case of Epizootic Abortion. The Agglutination test has, however, been very largely adopted, and as to its reliability the report of the Development Commissioners for 1920 may be quoted. It states that "more than 10,000 blood tests justify the conclusion that this method of diagnosis is almost marvellous in its accuracy," . . . . "and the plan has been applied with complete success to a few of the most valuable herds in the country, these herds having now for several years been completely free from the disease."

Sir John M'Fadyean, who initiated the experiments in this direction, states clearly in the "Journal of Comparative Pathology" of March, 1921, that "though this method has been eminently successful in some cases, in a greater number of the outbreaks in which his advice and assistance has been sought, the plan from the outset was seen to be impracticable and had to be abandoned after a trial." That part of his report, so far issued, deals only with those herds successfully treated.

The herd first referred to in this report, which included 109 cows, 18 heifers in-calf, and 29 young heifers, had suffered very severely from Epizootic Abortion, which was known to exist in it in 1911, in which year the young heifers it then contained, were inoculated before service as a preventive measure. This was repeated in 1912, but cases of abortion continued to occur. The Agglutination method of testing and the isolation of re-acting animals in this herd was commenced in 1914, in one year the disease was completely eradicated and no case has occurred up to the end of March, 1921.

The second, a large herd of pure-bred cows, each of the living calves of which was estimated by the owner to be worth £100, was subjected to treatment on the same lines in 1917, and since July, 1919, has remained free from abortion.

In the third recorded instance, a pedigree herd of 60 cows, this test was applied in May, 1914, and since March, 1916, no case of abortion has occurred in the tested animals. The herd remained free from abortion till March, 1917, when some cows of the tested herd calved before their time. These were again tested with negative results, showing that the premature births were not due to infection with the bacillus of Epizootic Abortion. In July, 1918, blood from a cow, which the owner of the herd proposed to purchase, was tested with positive results, showing that she was infected with Epizootic Abortion, consequently the animal was not brought into the herd. On some subsequent occasions animals whose purchase was contemplated, were tested with negative results, and introduced into the herd. In January, 1919, a cow which had aborted 17 weeks after service, gave positive results. It transpired that this animal in 1915 re-acted to the tuberculin test, but for some reasons was not subjected to the abortion test like the rest of the herd

The successful results on three other herds are described, but we have yet to learn what occurred in the herds tested with less successful issue.

The value of the Agglutination test lies in the fact that it renders possible the separation of the infected from the healthy. This involves seggregation and isolation of that portion of the herd found to be infected, the animals in which are tested periodically and those which fail to re-act are after due precaution returned to non-infected herd. It is obvious that eradication of Epizootic Abortion by this method is not likely to be obtained unless the facilities for isolation exist, and this is scrupulously maintained. As a measure for preventing the admission of infected animals, the Agglutination test may be used with confidence in its reliability. Like other humanly contrived agencies it probably is not absolutely perfect, and even though its reliability to induce a re-action when applied to infected animals is accepted, there remain some possible sources of fallacy. It has been before stated that a period elapses between the time of entrance of the virus into an animal's system and that when she becomes infected. It is during this interval, which varies in length from about seven days to three weeks or a month, that the test may indicate that the animal is not then infected, while, if applied again within a month or so, a positive re-action would result. This can, of course, be obviated by a second testing in three or four weeks.

It is not within the scope of this article to enter into details of the testing. It will be sufficient for our purpose to state that the only operation carried out on the farm is that of withdrawing a small quantity of blood from the animal, placing it in a suitable vessel with the observance of certain precautions, and despatching it to a laboratory where it is subjected to the test by the expert with whom rests the interpretation of the effects of the mixture of the serum of this blood with an emulsion of abortion baccilli to which in certain degrees of dilution it is added. Proper interpretation of these phenomena is of the utmost importance, and only that of the really expert should be relied on and taken for the basis of action. The above narrated experience shows that with the aid of the Agglutination test Epizootic Abortion may be eliminated from infected herds within a reasonable period, but it must be borne in mind that the method is not adapted to all circumstances and should be adopted only on the advice and carried out under the direction of an expert. Under any conditions attempts to control and eradicate such a disease will call for the exercise of thoroughness in detail and patience. It has been stated that in animals in which the agglutination test is negative three weeks after an attempt to infect, it generally remains negative and indicates that the animal has not become infected. In its favour is the fact that no disease germs are brought into the herd, so that there is no risk of introducing or spreading the disease. A consideration arises of no small importance, viewed in the light of the report of Sir John M'Fadyean's experiments, in which it is stated that, though the virus of abortion does not live long in the womb of the non-pregnant animal, it has been found that some cows re-act to the Agglutination test as long as seven years after their last abortion. During the period of non-pregnancy the bacilli may be found in the udder, its glands and the milk, also in the udders of virgin heifers after injection into the jugular vein. Bacilli of Abortion were not found in the milk of a cow unless her milk and blood possessed agglutinating properties, but the milk from re-acting cows did not always contain abortion bacilli. This indicates that cows which have not aborted for years may be carriers of the virus. It also suggests that inoculation, to which we are about to refer, may possess an element of danger which can only be averted by application of the Agglutination or other reliable test.

Another plan in operation, having the object of controlling and eventually clearing our herds of the disease, has been very widely adopted at the instance or with the advice and assistance of the veterinary advisers of the Ministry of Agriculture. This is apparently based on the common observation that under favourable conditions there is a natural tendency for Epizootic Abortion to die out, largely, if not altogether, due to immunity acquired by animals which have been affected. It consists of introducing large doses of abortion bacilli by inoculation with a view of infecting all the non-pregnant females in herds in which the disease exists and so establishing that immunity which will allow them to resist further attack. Cows which are in-calf are inoculated as they become non-pregnant, and maiden heifers sometime before service by the bull. Disinfection of all discharges is advised and appears desirable as a precautionary measure against conditions, which may in future arise, but I am assured that in the trials carried on in Oxfordshire, about to be alluded to, this part of the latest instructions was entirely disregarded. Isolation is not called for in the adoption of this method, the aim of which is the infection of every susceptible non-pregnant animal in the herd as soon as practicable. Several thousand animals have been treated by this plan under the ægis of the Ministry of Agriculture, the extent of the trials may be approximately gauged by the number of doses, reaching to something like 30,000 in one year, issued from its laboratory and applied under certain conditions which should have supplied a vast amount of information regarding its value as a practical measure. The general results obtained have not to our knowledge appeared in any official report, though anxiously looked for. That portion of the trials carried out at the instigation of the County Council of Oxfordshire in that county has, however, been the subject of two reports, which embrace the results of operations undertaken from 1911 to 1916, during which period more than 5 per cent. of all the cows and heifers in milk in the county were inoculated. For the trials the infected herds were voluntarily submitted by their owners. Operations with 14 herds commenced in 1911 were carried on to 1913. With the inoculated animals there were placed as controls 25 per cent. of uninoculated heifers and cows, some of the latter having aborted before. It was ascertained that the average incidence of abortion in the herds in the year prior to the commencement of the treatment was 28.9 per cent. (i.e., about one in every four animals) aborted. After Anti-Abortion treatment 5.7 per cent. (i.e., about one in every 18 animals) aborted. Among the "control" animals 18.2 per cent. (i.e., one in every six animals) aborted. These results were so satisfactory to the owners that inoculation was continued during 1911-1916, in some of the herds in which abortions, though fewer in number, were still occurring. It appears that in four of 14 herds treated in 1911-1913 no abortion happened in 1914 and the treatment was discontinued, while it is stated that among all the animals inoculated in the period 1911-1913 only six abortions took place during 1911-1916. It is, perhaps, impossible to form an opinion as to how much of this decrease may have been due to the artificial infection or to immunity naturally acquired from having previously aborted. That the favourable result is largely the effect of the inoculation can scarcely be questioned when the relatively large percentage of abortions among the control animals is taken into account. The number of abortions had been further reduced by the end of the second period of trials to less than 2 per cent. When we come into possession of the results of all the "vaccinations," as these inoculations are sometimes designated,carried under the direction of the Ministry of Agriculture, it is hoped that it may be easier to form a reliable opinion, especially as to the later effects of the method and of its value and practicability. It is obvious the larger field of operations would afford safer ground. We are, however, now in a position to accept that it is a means of very largely reducing the number of abortions after some years of application. We are not yet quite assured that after abortions may have ceased there will be no recurrence of the disease from infection remaining on the farm. In this relation we may recall the statement that a cow, which has once been affected with Epizootic Abortion, may after the pregnancy when she last aborted, remain infected and discharge abortion bacilli. If this is correct, and so far as our knowledge goes, sufficient evidence has not been adduced to controvert it, a cow, which is a "carrier," must remain to a greater or lesser extent a source of danger, particularly to animals which have not been rendered immune, coming in to replenish a herd. While this matter is *sub-judice*, as it were, expression of an opinion of the respective merits of the methods of inoculation and isolation must be reserved, thóugh it is, perhaps, only candid to state that a large proportion of stockowners and veterinary surgeons, who have been intimately associated with the trials of the inoculation procedure, express a high appreciation of its value.

The trials of the testing and isolation plan for the eradication and prevention of Epizootic Abortion have supplied us with results, which we venture to think, must be regarded of the first importance to stockowners, whose herds are affected, and its adoption where the necessary conditions exist should be seriously considered.

Immediately before the advent of the methods just referred to, the so-called system of Nocard—disinfection and isolation—was received with much favour and appears to have been regarded by the Departmental Committee when reporting in 1909 as the most rational means at disposal up to that time.

An intimate experience with the earlier method impressed the writer with the view that the results of its adoption largely depended on the degree of thoroughness with which its details were carried out, and we now venture to think the same remark is applicable to methods which seem destined to supersede or supplement it. The power to determine which animals are infected and those which are not, immensely relieves the situation and facilitates the carrying out of complete separation and isolation. As a means for protecting a healthy herd from the danger of introducing infected animals, the test cannot fail to be of the greatest value. No special treatment is used, and the opportunity for animals to acquire resistance naturally is the same. It came within the writer's experience more than a quarter of a century since that in many instances Abortion more or less permanently ceased on farms in the course of one or two years after the adoption of such isolation and disinfection as were then possible, and within the last few weeks it has been ascertained that in some herds subjected to the treatment in 1891 and 1892 there has not been a case of Epizootic Abortion since. That it conferred great benefits on individual stockowners there is little room to doubt, but as a means of stamping out the disease from a country in a reasonable time, it is, we think, incompetent, while there exists the danger of the "carrier" harbouring the germs and disseminating the disease—a disaster which can now be averted by application of the Agglutination test.

The idea of a cure for Epizootic Abortion has naturally attracted a good deal of attention, but as might be expected from the nature of the disease, in the subjects of which the mischief is done before its existence is discovered, the position, at any rate with our present knowledge, is regarded practically hopeless. In this connection probably the internal administration of carbolic acid had at one time gained a certain amount of credit, but other drugs have been credited with curative powers. Some have been experimented with and yearly decrease in the numbers of abortions recorded, but the declines as reported in annual figures, differ so little from those common to a large proportion of outbreaks under natural circumstances without any artificial interference, that such cannot be taken as confirming evidence. We have not yet read of an experiment in which a considerable number of animals of the same herd to which carbolic acid had not been administered were subjected to the same conditions by way of control. It is difficult to conceive that doses of carbolic acid, which do not seriously affect the cow, could reach the abortion bacilli in the womb in such proportions as to kill them or inhibit their action through the disinfecting properties it possesses. The alleged cure of Epizootic Abortion by carbolic acid or other medicinal agent, we think has not been substantiated. The reference is made rather with a view of expressing the opinion that prevention of such a scourge and not cure should be our aim.

Limitations of space do not permit the consideration of certain unfavourable conditions, such as barrenness, which not infrequently follow Epizootic Abortion of cows. Indeed, the facts, which have been revealed by experimental enquiry since Dr. Bang announced his discovery of the causal factor are so numerous and suggested practical application that incorporation on such occasion would be not a little perplexing

The legislative measures, so far adopted with a view of controlling Epizootic Abortion in cows, must be regarded as mild in character, at any rate, no complaint has been raised as to their severity. The nature and the alarming prevalence of the disease contra-indicate the adoption at present of such strict and comprehensive regulations as are applied to some other contagious diseases of animals. Anything in the nature of general restriction on movement could not fail to disorganise dairying and cattle-breeding throughout the country.

This disease was first brought within the operations of the Contagious Diseases (Animals) Act by the Epizootic Abortion Order of 1920. The adoption of the Order by local authorities was optional, and, like most enactments of a permissive nature, failed to convey the impression of confidence in the power of its provisions to accomplish the object for which it was ostensibly issued. This patent defect was immediately recognised and representations made to the Ministry of Agriculture by agriculturists, culminated in the issue of the Epizootic Abortion Order of 1921, which came into operation on the 1st October, 1921, and repeals that of 1920. "This Order shall be executed and enforced by the Local Authority" and is thus compulsory. It makes it illegal to expose or cause to be exposed in any market or saleyard, a cow or a heifer which to the owner's knowledge, or according to information supplied to him, has calved prematurely within the two months immediately preceding such exposure.

The same applies to the private sale of such a cow or heifer unless before the sale the vendor gives to the purchaser notice in writing of such premature calving. The Order prohibits sending such cow or heifer to the bull within two months of prematurely calving, unless notice in writing be given to the owner of the bull: Provision is also made prohibiting turning out on common or unfenced land, or of grazing in a highway of such cow or heifer. This is undoubtedly a move in the right direction, and if the provisions of the Order are conscientiously carried out they will provide some check to the spread of the disease and afford a degree of protection to stockowners. but this or other legislative measures can only be regarded as auxiliary to the personal efforts of owners of infected herds to eliminate the disease and those of the owners of healthy herds to prevent accession of infection. In times past the knowledge possessed was not equal to the occasion, but though an extended experience may be required for the perfection of the means at our disposal for controlling the disease. it appears that already we are in a position to materially reduce our losses by the adaptation of measures based on knowledge which promises to ultimately eradicate the scourge.

II.—THE SYSTEMATIC FOLDING OF PIGS ON ARABLE LAND.

By A. Harbord.

English farmers have seldom had to face a more critical period than that which now lies ahead of them, a statement which applies with equal force to almost all branches of agriculture. The slight reduction in the wages of farm labour is far from compensating the farmer for the disastrous fall in the price which he can obtain for grain, fat stock, dairy cattle or produce, nor is the balance redeemed by the accompanying fall in the cost of fertilisers and feeding stuffs. Among the most difficult problems to be solved is that of securing a fair return from upland arable farms, especially from those where the soil is a thin chalk soil, and where the mainstay of the farmer has hitherto been the folding of sheep. Though the price of mutton and wool will possibly improve as time goes on, yet the calculation of profits on such a farm is likely to prove an uncertain process for some time to come, and it is with the idea of providing an alternative system that this account of pig-folding on the Friningham Hardy Stock Farm is given. The demand for pork and bacon appears to be on the increase, and a description of the system as actually practised on this farm in 1921 may prove of value.

The summer of last year could hardly have provided a more exacting test of the merits of pig-folding. Some crops failed altogether, water had to be carted for the stock, and additional food provided, owing to the absence, during the whole of the summer months, of 75% of the average rainfall in the district. In spite of the drought, however, the stock showed a satisfactory increase in live weight without the expenditure of undue amounts on food or labour. The nature and position of the land, a thin chalk soil, 500 feet above sea level, would have made it economically impossible to supply organic manure except by stock folding. The soil was exceptionally poor, and is estimated locally to be worth a rent of 5s. per acre, per annum.

1. STOCK.

Two lots of pigs were kept out of doors during the spring and summer.

Lot A, numbering 40 in all, were folded from March 13th to September 2nd. It was composed of large sows, well-grown gilts, and a few strong hogs. These were of several different breeds.

(1) My own specially hardy breed, all of large size.
(2) Registered pedigree Large Whites.
(3) Registered pedigree Middle Whites.
(4) Registered pedigree Large Blacks.

Many of the above pigs were derived from the most valuable and well-known herds of their respective breeds. In-pig sows were withdrawn about a week before the date of farrowing and replaced by others. They all throve well on the treatment accorded with the exception of the Large Blacks, which soon showed signs of loss of condition and had to be withdrawn, not so much from lack of hardiness, as from lack of alertness, and from failure to secure their fair share of the small bulk of concentrated food supplied.

Lot B consisted of 40 younger pigs from five to eight months old, most of which were gilts, many of them being in-pig. They were folded from May 6th to September 2nd.

2. CROPS AND ACREAGE.

Though the pigs were folded on about 15 acres, the crops on only 11 acres of this area were fed to them.

The 15 acres were made up of :—

(1) Four acres of swedes, of which crop half were pulled and carted to the farm.
(2) Two acres of kale.
(3) Two acres of rape.
(4) Three acres of rape (2nd season's growth).
(5) Four acres of red clover and rye grass, of which half was cut for hay.

With the exception of the clover on plot five, where the soil was a stiff clay, the crops were grown on a chalk escarpment. Owing entirely to the phenomenal dryness of the early spring and to the great heat and drought of the summer all the crops quickly showed signs of flowering and were greatly below the average in their yield. Early " Topping " was resorted to in some cases and proved very beneficial. In fact, had this plan been more extensively carried out, the amount of greedily eaten food would probably have been tripled—a point worth noting for future guidance under similar exceptional conditions. It was possible to supplement the 1921 crops by mangolds. for in 1920, a good mangold year in this district. 3½ acres of the best land in the field in question grew 140 tons of excellent mangolds. Salt, and Potash Salts had been applied to this area, with, on about one third of the poorer portion, a minimum dressing of nitrate of soda. Mangolds were so plentiful in 1920, that no bidders could be found for them at 10s. a ton, which therefore has been taken to represent a liberal estimate of their cost. They kept perfectly, the last being used in September, 1921, and proved to be of inestimable value during the drought.

3. FEEDING.

On March 13th Lot A was penned in the swedes. About 20 rods were enclosed at a time, and the folds were shifted every 4th day, or longer, the time varying with the weight of the crop on any particular area, until the whole was thoroughly cleared up. In addition about 7 lbs. a head of mangolds were thrown in once or twice a day from heaps alongside each fold, which had been carted from clamps in the same field.

THE PIGS ON SWEDES
(showing also one of the Mangold Clumps partly used).

SOME OF THE SPECIAL FRININGHAM PIGS ON RAPE.

The Pigs on Rape.

The Pigs on Kale.

The only purchased food given consisted of dry ground-nut cake (kibbled) fed in the morning, and of soaked maize in the evening. This was spread widely about on the ground. The actual cost of this purchased food was about 2⅛d. per head a day, or as checked over a longer period 1s. 1d. per head per week. Later the kale and rape were folded in succession until June 30th, the same quantities of mangolds and concentrated foods being supplied as during the former period.

Lot B were folded on the second area of three acres of rape on May 6th. As with lot A, mangolds, ground-nut cake and soaked maize were given, but the quantities supplied of these foods were smaller. In addition a thin wash of barley and baker's sweepings, etc., was given once a day. The total daily cost was 2¼d. or about 1s. 4d. per head per week. For the last month before October 18th, rather better rations were supplied.

On June 30th, the whole of the pigs, lots A and B, with some additions to their numbers, were removed to folds on the red clover and rye grass. As the effect of the exceptional drought would have been to make the rye grass stalky and unpalatable, it was decided to cut half the crop for hay, alternate sections 20 yards wide being cut. This must be taken into account when estimating the expenses of the pig-folding. Four tons of hay were made at a small cost for labour, and were valued at £30, and as the crop had been bought for £20 in the spring, on condition that the whole ground was systematically pig-folded, nothing can be charged against the pig account on this head.

It may be noted here, that, as the result of several experiments, I find that the addition of rye grass, which quickly loses its succulence, greatly lessens the stock carrying capacity of the crop. It not only leads to considerable waste, but prevents the rapid growth of the second crop.

In former clover-folding experiments I had found that strong pigs maintained condition, and made satisfactory growth for a month at a time without the addition of any purchased food. But in this remarkable summer the rapidly diminished succulence of the clover, and the excessive heat soon told on them. Moreover, the mowed sections, which I had counted on to help out to some extent with the feed, produced no second crop at all, owing to the absence of even a single satisfactory shower of rain. Under these circumstances lot A required and had their former rations, except for the mangolds, which were needed for other stock, while lot B had their rations increased by 20%, bringing the cost per head per week in this case to just under 2s.

4. HOUSING.

In previous experiments in pig-folding it had been found that during the spring and summer a large proportion of any hardy breed of pigs prefer to sleep out of doors. This was above all the case with my own specially selected pigs, which could be counted on to sleep out in any but the most inclement weather. Consequently it was not necessary to add to the accommodation already existing, which consisted of an inexpensive, and quickly erected house, without flooring, measuring 30ft. by 9ft., constructed of second-hand galvanised sheets. This was capable of holding at most about half of the 40 pigs constituting lot A. and was placed in the middle of one of my permanent areas for experimental folding. No housing was at first provided for lot B. as these pigs were not moved out until May 6th.

After June 30th, when both lots were moved on to the clover and rye grass area, the only shelters used for nearly one hundred pigs were two tarpaulins, each measuring 40ft. by 12ft., stretched on poles, the poles being supported on four pig gates to which they were firmly tied, and the gates being arranged so as to make three sections under each tarpaulin. These shelters were put up chiefly as a protection against the sun in an otherwise shadeless field during the weeks when the temperature frequently rose to 90° Fr. in the shade. Each shelter could be taken down, moved and re-erected by two men in less than an hour so that the cost of this operation may be put at a maximum of 2s.

5. FENCING.

The fencing consisted of two permanent base lines, and movable sides. The base lines were differently constructed.

(1) Three feet stout guage, 1½inch. mesh, galvanised rabbit netting, with posts five rods apart and driven spiles every 4ft. This was strengthened by two well-strained lines of barbed wire, the rabbit netting being needed for the protection of the crops to follow after the pigs. In spite of the fact that the pigs were folded first on one side of the base line and then on the other, and that the pigs were large and powerful, this fence is still standing as straight and undamaged as when erected.

(2) Ideal Fencing. This is found fairly satisfactory on level ground, but care must be taken to have it properly strained, by no means an easy matter, without going to the expense of substantial straining posts.

The movable sides for pens consisted of the ordinary five slatted sheep gates or hurdles, 7ft. long, costing from £10 to £12 per 100, but useless unless extra slats are added, or as was done here, fitted with a simple arrangement of barbed wire. This extra fitting can be done at a cost for labour and material of about 1¾d. a gate, which is then absolutely efficient. My estate man has recently made, to my design, a more handy and lasting gate, also 7ft. long (equally suitable for sheep folding), which it may be possible to sell at £12 per 100, or say 1s. per yard run.

For handiness and quickness in forming safe folds nothing in my experience equals these gates. If well constructed of the proper material they will last for several years, provided they receive fair usage and common sense storage. No other domesticated animal will test a fence like a strong sow, and when a herd of pigs break bounds the serenity of most men's temper is sorely tried. This must be my excuse for dwelling at such length on the question of fencing, often—as I know— the only obstacle which prevents many people otherwise anxious to do so from attempting the systematic folding of pigs on arable land.

From what has been said above it is clear that only a very moderate outlay is required to fence and house pigs in the open. I think, too, it will be agreed from the following figures that the running expenses were light in proportion to the number of pigs.

(1) Cost of labour for feeding in folds averaged 20s. per week.

(2) Making new folds, moving shelters, etc., 5s. per week.

(3) Haulage of food from store, mangolds from pits, and hurdles, 12s. per week.

To these must be added as an exceptional expense due solely to the season.

(4) Haulage of water 18s. per week.

Making a total cost under these four headings of £2 15s. per week, or 8½d. per head per week, at least 50% of which was due to exceptional conditions.

6. CONCLUSIONS.

It only remains to give as accurate an account as possible of the results obtained, though for obvious reasons it is not possible to reduce the results to exact figures in pounds, shillings and pence. First, as to the condition of the stock, which were all treated exactly alike throughout the experiment. The actual losses were confined to one, and that one the smallest of lot B, which died from heat stroke, a fate not confined this year to pigs kept in the open air. Besides this, out of 40 sows and gilts farrowed in this period, two suffered from milk failure, but of the remainder 34 had litters varying from 8 to 17 pigs. The first 8 litters produced. when the youngest litter was 14 days old, numbered 84 strong young pigs. The failure of grass and succulent green food was a most serious matter and undoubtedly was the cause of the milk shortage in the sows. Other difficulties in the season under review were the inferior quality of the middlings available, and the temporary shortage of cocoa-nut cake. Nevertheless the photographs reproduced here will clearly show how satisfactory was the general condition of the pigs.

At the date of concluding this article, November 20th, 1921, all classes of pigs have fallen heavily in price, and it is therefore an invidious task to estimate the increase in value of many of the pigs, especially of the choice pedigree stock, both adults and litters. But while waiting for better times, one is on safe ground, in booking their value at the current commercial prices. Of the litters of the commercial class, *i.e.*, not pedigree animals, sold when from 12 to 14 weeks old, it is satisfactory to be able to state that several of the gilts and sows can be credited with returns of £25 to £40 a litter, these being the actual sums realized. Of the better gilts for breeding many were sold at an average of 20 guineas.

Of the lot B pigs, the younger averaged on May 6th under four scores live weight, and were, I think, fairly valued on that date at 70s. a head, as they would not fetch breeding prices. The cost of feeding, charging these smaller pigs at the same rate as the larger, would work out as follows :—

	s.	d.
May 6th to June 30th (eight weeks) @ 1/4 per week ..	10	8
June 30th to Sept. 2nd (nine weeks) @ 2/- per week ..	18	0
Add labour, including horse (17 weeks) @ 8¼d. per week ..	11	8
	49	4

If this be added to the 70s. initial value, then their cost value on September 2nd would work out at £5 10s. 4d., when many of them weighed from 9 to 13 score. Their average market value on September 2nd was estimated to be certainly in excess of £7 10s. In fact with two to three weeks liberal feeding they realized £10 and upwards. That such results can be obtained during a season, when the rainfall fell from the usual 24 inches to 6 inches only in 9 months, a season of difficulties and disappointments only realized by those who have passed through it, must convince the reader of the great value of the "Folded" pig, not only as a dividend payer, but as a real national asset. For, besides the financial results tabulated above, there must be placed to the credit of the system the fact that the whole of the ground was left evenly manured and wonderfully clean. I must admit that the clover-folding experiment was disappointing, but this was due as I have shown to quite unusual circumstances, and even so, when it is realized that the stock was carried in the face of the entire absence of succulent pasturage and of the expected catch crops at a most moderate and distinctly paying cost, the result can only be qualified as eminently satisfactory.

A brief reference must be made to the after cultivation of the land, because it illustrates some of the great advantages of pig folding in spite of the adverse season. The ground carrying swedes, kale and rape, in all eight acres, were ploughed as soon as it was clear of the folds; cultivated, harrowed and sown, being in good clean condition. Two acres of mangolds were sown, singled, and horse hoed twice, and look as well if not better than the average crop on good land in the neighbourhood. Tares, rape and lucerne unfortunately failed to establish themselves in the absence of any moisture, but an early sowing of kale produced as good a plant as I have seen. In previous years I have grown on poor land two four qr. crops of wheat in three years, without artificials and without the dung cart or its accompanying expenses of carting and spreading. The intervening year, when clover was grown, showing a large profit per acre by means of pig-folding.

In conclusion--A word of warning. The evolution of the pig, for perhaps two centuries, has been mainly in the direction of complying with show points as laid down by the great Breed Societies, with the obvious and an avoidable result of impaired constitution and stamina—two qualities, essential in systematic pig-folding—especially in Winter and Spring. With a 25 years experience and experiments entailing losses at one time or another of above £2,000 with most breeds as applied to folding, I have learnt much bearing on the subject, foremost perhaps being the fact that Latent Tuberculosis is prevalent to a degree quite unsuspected. This disease rapidly developes under conditions which I regard as *inseparable from folding carried out as it must be, if the system is to become permanent and largely practised, in Winter and the inclement months.*

Some notable breeds—as the Americans have long since discovered—are totally and undoubtedly unfit for the purpose.

These breeds are notorious for tuberculosis. One of the largest continental butchers (also interested in the scientific aspect of farming), assured me that as great a proportion as 70% of pigs had tuberculosis in various stages, as verified by personal examination. To those who contemplate the practice of Systematic Folding (as I understand and practice it), on an extensive scale, my advice is, avoid buying droves of cheap pigs and do not indulge in the belief that you are purchasing immunity from hereditary disease and enfeebled constitutions by buying the progeny of medal and cup winners. Stock up from hardy grazing and folding pigs of several generations proof. Then build up your herds, and the result will not disappoint you. Systematic Pig-Folding needs the pig for the purpose.

With a proper understanding of its working, intelligent application of known data, and the use of really hardy pigs, pig-folding may be relied on not only to pay its way under all conditions, but also to fertilize the soil free of cost and leave it clean and ready for ploughing and seeding. In the absence of new discoveries, and given a repetition of the corn prices ruling in the nineties, the old procedures will not work on second and third rate arable land. It is incumbent on all connected with the soil to be prepared to meet a possible combination of circumstances which might mean disaster under present day practices, and I believe I have shown in the present article one method by which they may successfully be met.

III.—THE SOILING SYSTEM.

By Gervaise Turnbull.

(Late Instructor in Practical Agriculture at the Harper Adams Agricultural College).

With the insistent demand for increased production a good deal of interest has lately been manifested in the restoration of the Soiling System as a means of feeding live stock.

Re-introduction would perhaps be a better word, so far as most districts are concerned, for soiling in its proper sense has for many years been almost a dead letter in this country, though in the eighteenth century—when it was discovered by a Cumberland farmer—and later, much more was heard of this intensified method of farming than in the more strenuous years of the twentieth.

One of the earliest writers on the subject, Sir Humphrey Davy, whose interest in agriculture was not confined to the chemical side thus describes the advantages of soiling in his famous lectures on

Agricultural Chemistry—" In feeding cattle with green food there are many advantages in soiling, or supplying them with food, where their manure is preserved, out of the field ; the plants are less injured when cut than when torn, or jagged by the teeth of the cattle, and no food is wasted by being trodden down." " They are likewise obliged to feed without making selection, and in consequence the whole food is consumed ; the attachment or dislike to a particular kind of food exhibited by animals offers no proof of its nutritive powers. Cattle at first refused linseed cake."

The advantages here claimed hold good fairly well to-day, and this learned writer might have added the point which is of such vital interest to the economical farmer of the present day that more stock can be kept on the same area of land. This is, indeed, the great and most appealing feature of a system which has also other points to recommend it over the time-honoured method of grazing as generally practised in this country, but not on the Continent, where the more economical system of tethering cattle is popular. Soiling, too, is there understood and practised, as in Denmark and Holland, where the feeding of the refuse sugar beet has lately to some extent taken the place, in the latter country, of green crops.

It is now a common place of arable and mixed farming that more cattle food can be grown per acre than on grass-land--four times as much as in grazing is claimed for the Soiling System- but this increase is not merely due to the lessened waste from treading, which is very considerable, and from fouling the ground, but to the fact that the system is productive of more manure, which means, in turn, extra yields. There is then a smaller drain on the fertility of the soil, which tends to become cumulative, and thus the process becomes in time distinctly ameliorating, instead of impoverishing, as too often happens at present on grass-land where cows are kept.

This happy result is partly brought about by the large amount of manure which is returned to the land, and partly by the direct effect of the plant residues—leguminous and otherwise—which it is possible under this system to foster in a high degree, and not the least part of their useful function here is the mechanical effect on the staple of the soil, to which further reference will be made.

To these considerable advantages may be added the fact that cattle can be made more comfortable under the Soiling System than under grazing (flies alone mean a good deal in late summer !) and the foods better utilized. The results are seen in a tendency to rapid fattening and certainly in flow of milk, for both kinds of husbandry are associated with soiling.

Against these good points it is only fair to enumerate the disadvantages, which are not numerous, nor let us add, by any means insuperable. They are largely associated with the labour question, but the labour bill depends a good deal on the nature of the crop so far as expenses of cultivation go. Some of the crops which are now recommended are far from exacting in this respect, and from their smothering nature exact the minimum expenditure on cleaning the land. The labour of cutting and carrying the produce, of course, adds seriously to the total cost of production, and to this must be added the inconvenience of the necessity of daily cutting whatever the weather.

Another difficulty associated with the weather and the season is that experienced in finishing off one crop as the next one is ready, for adherence to a fairly definite time table both in sowing and feeding is of the essence of the business, and failure of any particular crop must be carefully provided for, as far as possible, by a substitute. To farm on the Soiling System implies necessarily, therefore, capacity for planning and looking ahead, and a definite programme (possibly of a complicated nature) more than is the case with ordinary farming, and this does not appeal to every man.

The advanced arable farmer, however, is no stranger to soiling in this sense, though the term is properly applied to feeding the cut crop as distinct from folding, and as such, in a very modified form, is, of course, familiar to many farmers and no new thing.

Again, soiling can be combined with ordinary farming, and herein lies probably its future possibilities in many, if not in most cases, because soiling pure and simple pre-supposes condition of land and surroundings which are by no means always available and grass-land in the height of summer is very hard to beat as a sound and cheap milk producer. Silage, too, works in with soiling.

At the present time of transition the Soiling System seems to offer a halfway house of security to the harassed farmer who is suffering on the one hand from diminished pasturage and probably on the other from an excess of straw from increased area of corn, together with the additional foulness of land which always accompanies this change. It affords a means of conserving the fertility of the broken pastures which are only too liable to be soon exhausted and to go back to grass in some form, if there is not sufficient stock kept to supply the manure which they need after corn growing. Foulness in land tends to disappear altogether under the beneficial effect of bulky forage crops, and this alone is a great point in favour of soiling.

With these introductory remarks I will pass on to a consideration of the system in practice at the Harper Adams Agricultural College, which has recently attracted such wide interest, and which has now been successfully carried on by the Vice-Principal, Mr. J. C. Brown, for several years with a herd of ordinary milking cows of Shorthorn type.

The work was begun experimentally on a small scale a few years ago, and was the first of its kind to be carried out in this country for nearly a century, the preliminary work being confined to getting a suitable succession of summer crops and in gradually perfecting the rotation, for which there is endless scope, both in material used and in the proportions observed in the mixtures. Subsequently the plan—which has since been followed—of maintaining the herd throughout the year on the produce of arable land was adopted, and this is claimed to be an entirely new departure in farming. Needless to remark fears of failure were freely expressed by practical men, but their prophecies were not fulfilled, and it is claimed with truth by the author of the scheme that the results of the year 1918-1919—the first completed year—have "unquestionably shown that stock farming on arable land can be practised with success, while the opportunities for development are almost unlimited."

The system makes for intensive production on a high level, and profits at least equivalent to those in other methods of farming are confidently claimed. Another point of much interest emerges from a study of the financial side of the year under mention. The labour bogey is not nearly so terrible as is generally supposed. In fact the usual objections are found not to apply when the matter is considered in the light of increased production—Milk per gallon costs no more, because the flow is greater, just as we find in well managed herds liberally fed.

In fact, as already hinted at, a good deal of labour normally expended in ordinary farming is found not to be necessary, as the crops themselves do some of the cultivation, and by their dense growth render weeding largely unnecessary, and this is a point of the utmost significance at the present day, well worth more consideration in connection with arable farming generally, and along with it may go enrichment of the land.

YIELDS OF MILK.

A few figures will show what has been done in the way of milk production. Comparing the system with similar land under grass we find that in 1917, 500 gallons of milk were produced per acre as against 198½ gallons under grass. In 1918-1919, commencing May

9, 13 cows were kept throughout a year on arable land produce, and yielded 548 gallons per acre on 15½ acres, or 652 gallons per cow, the land being strong loam on New Red Sandstone, in rather poor condition when taken over. Cake and litter only were purchased, and it seems clear from the Report on the experiment that under more favourable conditions the yield of milk would have been considerably higher.

Winter calving, for example, which is the ideal to be aimed at, was out of the question with many of the cows, half of which were late summer calvers, and war conditions prevented the growth of sufficient pea and oat hay, which is a great stand-by for a large part of the year, only oat straw and mangels being available during part of the winter, and much of the concentrated food (meal) being of poor quality. The land, was mainly full of fertility, but the cows were not first rate. The produce consumed was 7·2 acres of green fodder crops, the estimated produce of 7·18 acres of pea and oat hay, allowing 2·5 tons per acre, and the estimated produce of 1·1 acres of mangels, reckoned at 30 tons per acre.

After the end of the year under experiment the cows still milked well, being kept during the summer of 1919 under the same conditions as before, the yield not being affected by the long drought in that year, which is another point of much importance when considering the relative merits of grass and arable. This is shown by the larger return of milk given from October 1st, 1918, to September 30th, 1919—735 gallons per cow, though this is partly accounted for by several of the cows were dry during the year, starting May 9th, 1918, for rather a long period. The cows, in fact, during the drought were not influenced by it, though yields fell elsewhere.

From these figures the conclusion is drawn that "considerably more milk can be obtained per cow under the Soiling System than from cows kept in the usual way." The uniform supply of fodder, and the more even life led by the cows no doubt contributes to the result. This capacity for improved milk production which cows seem to show is a matter of much importance, for the numerous tests which have been carried out under the more ordinary system of feeding cannot be said to give much encouragement in this respect, and the slow method of selection seems to be the only means of improvement. But here higher average yields were given by the cows than at any time previously, although several of them were very old cows. Subsequent performances up to date have also been good, some of the cows remaining exceptionally long in milk.

SEASONAL DIFFICULTIES.

It is not contended, however, that seasonal difficulties are by any means eliminated by soiling, but it is clear from what has been stated that these are not more severe than under ordinary farming, and perhaps they may be considerably less. The crops obtained in the phenomenally wet year of 1920, mangels included, which were one of the best lots grown in the county, testify to what can be done in another year of extremes. These two exceptional years, in fact, have provided a useful test of the merits of the system under climatic difficulties such as are seldom experienced.

The drought of 1919 was naturally much felt, but the later crops at once benefited by the rain when it came, and peas especially did well, except those sown early with rye. Cabbage, which is the main crop for winter feeding, suffered considerably as a second crop, though fair results were obtained. Enough forage, however, was grown to keep the cows milking satisfactorily, as has been shown. The effect of the extreme rainfall of 1920, on the strong land was not favourable to cultivation, and cabbage again suffered. The somewhat drastic method was successfully adopted of putting out the plants in the furrow and ploughing them in, after-cultivation being almost impossible in 1920. This has produced very fair results, though maturity was again delayed, and smallish plants lasting into early spring of 1921 have resulted. Marrow stem kale was a considerably better crop, sown June 4th, and proved of much value in the autumn before the cabbage was ready. It is easier to cut (with a hook) and handle than cabbage.

THE FINANCIAL SIDE.

As remarked above the cost of production per gallon is not high compared with ordinary farming. An analysis of the cost makes this clear, for the whole cost of production of the fodder was 5·07d. and that of attendance on cows, carting and cutting fodder but 3·19d., less than one fourth of the total which works out at 15·5d., the difference being made up of interest on capital at 6 per cent, depreciation and risk 10 per cent, and cake and meal 4 3d. The latter might be thought somewhat a high item, at £18 per ton, but it is found desirable to give it throughout the year in order to maintain a high flow of milk and condition in the cows, though doubtless even in winter a considerable amount of milk could be got without its aid. But it is found that any undue economy in this respect is far from wise.

It is not possible to give figures up to date at present in these days of change before the issue of another report on the position, but it may be said that the labour bill is still within the moderate limits, which have characterized the scheme throughout. The cost of the pea and oat hay in 1918 was just over £9 per acre.

IMPORTANCE OF VARIETY IN CROPPING.

Attention may be directed here, before passing on to a survey of the crops used, to the great importance at the present day of endeavouring to extend the limited repertory of the cropping of the average farmer, for the double purpose of increasing production and fertility. The scope is considerable, in fact large, if soiling is included, and the present time seems favourable towards greatly increased initiative and effort in this direction.

Much has been done by leading seedsmen towards the improvement of some kinds of seed, but changes in rotations and kinds of crops have not met with so ready a response as the changed conditions of the times would seem to warrant—at any rate on an experimental scale. Farmers cannot be blamed for proceeding cautiously along new paths, but looking at the history of farming progress some change would seem to be due. Who is not tired of seeing large breadths of mildewed and impoverished turnips where something more profitable might be grown, and half crops of clover due perhaps as much to bad management as to over repetition; or inferior crops of poor grass when good temporary leys would provide far more and better keep?

Soiling quite apart, these are matters of great moment to farming and the scope is a wide one in rotations alone. The great value of leguminous crops in this connection is very slowly realized by the bulk of farmers, who have probably been too much influenced by the evil tradition of refraining from more than occasional use of most of these crops. But how much of these undoubtedly bad effects are under control, and due to a want of variety in the kind of legume grown?

More knowledge is undoubtedly wanted on this matter, and it seems a good field for experiment of a practical kind, but enough is known to warrant the belief that a considerable extension of the profitable growth of leguminous crops on the same ground could be arranged if suitable changes were rung in the varieties, a point which the writer has on other occasions striven to bring home. Grown too, in suitable mixtures with cereals the evil effect mentioned seems much lessened, if not quite absent (as this Soiling experiment is tending clearly to show), and thus a cheap and effective means of fertilizing is within reach of all.

In this connection, and as producers of much valuable fodder, peas and beans deserve far more notice than they usually get. They are fine soil pulverizers, and peas at least an excellent smothering crop. Yet, compared to mediæval and later days, when they were often taken triennially, they now take a back place in British farming. Even a hundred years ago their great value was more widely recognized than it is to-day. Their constant recurrence in the rotation of an earlier date—till ousted by the introduction of the Norfolk four-course—seems to throw strong doubt on the reputed ill effects of constant cultivation on the same ground.

The pulse crops were greatly used in old days, and doubtless made good to some extent the paucity of natural manure, and is there any valid reason why they should not again play this important role in farming? The extent to which they have fallen into disuse is reflected in the fact that considerable doubt and uncertainty seems to exist even as to the naming and differentiation of the different varieties and in the comparatively unimproved condition of both crops to-day.

There seems to be a wide field for improvement here,and advantage is being taken of it by the promoter of the scheme under review who is developing varieties specially suitable for this line of farming. The great success of the pea and oat mixture which he uses, and which was grown last year in Shropshire alone to the extent of some five or six thousand acres, is testimony to the value of one at least of the "black straws," and is of great educational value, and an earnest of what may yet be accomplished. The bean crop is also coming into line as a most valuable adjunct to many of these forage mixtures.

THE CROPS GROWN.

The rotation is necessarily somewhat elaborate, but briefly the method is to crop twice in the year about half of the land, and to grow the later forage crops on the other portion, the earlier forage crops being speedily followed by cabbage. Continuous cropping is thus provided for to a considerable extent, and alternation of cropping further guards against the danger of sickness. The latter, however, does not seem likely to occur under the system of mixed cropping even with leguminous crops, and the experience of severally ears bears this out. If this proves continually to be the case a good step forward will have been made, but there are other advantages in a rotation; the crops shown in the table constitute an eight year rotation, the whole of the crops passing over each plot in this time. Mangel, it will be noted, is not included in the scheme, as it will probably be best to reserve a field for the exclusive purpose of growing them. Cumulative fertility is then more easily provided and very large crops will be possible, for mangel does well when so treated. The following table details the crops grown under the 1918-19 experiment, and subsequently, though new combinations are constantly under trial, the evolution of the mixtures has been gradual. It should be mentioned, too, that a heavier seeding is now found best, four bushels instead of three, though combined in the same proportions. A few other alterations and additions will be found detailed further on, and maize has now been discontinued as being unsuitable to the neighbourhood.

This table, however, may be regarded as a standard one, as its value has been well proved, and the data quoted for the times of sowing and cutting have been found quite reliable. The intervals should be adhered to as closely as possible to prevent overlapping, which it is, of course, impossible to entirely prevent, especially in an abnormal year such as the present. An exception may safely be made, however, in the case of the pea and oat mixture, which does well when sown in February, March or April.

FIRST CROP.

Plot.	*Crop.*	*Seed per acre.*	*Time of Sowing.*	*Time of Cutting.*
		bus.		
A	1. Giant Rye.. ..	2	20th September	8th—31st May
	Winter Vetches ..	1		
B	2. Giant Rye.. ..	2	4th February	1st—12th June
	Field Peas ..	1		
C	3. Winter Oats ..	1	28th September	13th—30th June
	Winter Barley ..	1		
	Winter Vetches ..	1		
D	4. Wheat	2	4th December	1st—16th July
	Winter Vetches ..	1		
E	5. Oats	2	15th April	17th July—1st August
	Field Peas.. ..	1		
F	6. Barley	2	4th May	2nd—16th August
	Field Peas.. ..	½		
	Vetches	½		
	Field Beans ..	½		
	Oats	1		
G	7. Oats	3	28th May	17th—31st August
	Field Peas.. ..	1		
H	8. Maize	1½	20th May	1st—30th September

SECOND CROP.

Plot.	*Crop.*	*Time of Planting.*	*Time of Using.*
A	9. Cabbage	18th June	1st October—16th February
B	10. „	26th „	
C	11. „	6th July	
D	12. „	20th „	
E	13. „	5th Aug.	

As regards the merits of the different forage crops grown the palm must perhaps be given to peas and oats which have proved a great stand-by, both as hay and green forage, a rich and excellent food, of high albumenoid content, and superior as hay to clover. It is remarkable how the benefit of growing crops in unison, which is a marked feature of this experiment, is seen with peas and oats. The pea as a nitrogen collector is a powerful auxilliary to the oat, to which it evidently contributes this substance. This is shown by the luxuriant growth of the oats plainly visible when a certain stage is reached. It is, however, of great importance to secure the right type of oat, leafy large-strawed kinds being much the best, though any of the commonly grown peas may be used. The ideal oat has been found in the Duns, or the Clemrothery, and much better results will be obtained by using one of these in preference to others, comparatively unknown though they are, the Dunns being decidedly the better of the two, very broad in the leaf.

It must not be confused with ordinary grey winter oats or with the old winter Dun, as it is a spring oat not generally known, a local North Country variety. Excellent yields have been obtained in many localities, and some splendid crops of hay have been harvested, though the later sowings are naturally less heavy than the earlier.

Green cereals have shown their value, either with pulse or vetches or without, merits which have hitherto been generally known only to a limited number of flock owners, and of these barley and wheat are very useful, winter barley being very hardy, though the awns are not palatable to cattle after the early stages of growth. Either four or six rowed barley makes excellent forage, and there seems nothing to choose between them for winter sowing. Oats, barley and vetches (crop No. 3), has proved a very useful mixture, for the cows will eat as much as 120 lbs. a day if desired, as against 80lbs. of rye, and as much as 19 tons per acre has been grown. This season (1921) oats and barley are being tried separately (together with vetches and beans in the mixture). Wheat is somewhat of a novelty, Browick, with its long stiff straw being perhaps the best, and it has elsewhere in the county been used for forage along with vetches, and found superior to rye because it is less smothering, as it does not get ahead so fast as the latter.

A notice of the crops used would be quite incomplete without reference to the remarkable success of what is known as " Crop Six " (No. 6), though North Country farmers may claim acquaintance with something of this nature in the way of mixed corn. It appears to have all the advantages which are associated with mixing, the different kinds, though of differing heights, growing intimately together and producing a fine and varied mass of succulent forage, almost tropical in appearance. The beans make a bold show and though too coarse for hay, their great size and development is quite in keeping with green forage, and in mixing with cereal fodder. In fact they are being increasingly made use of in the soiling scheme at the present time and it is now found that 2 bushels is the best amount to use, as double the amount of beans have been found to give 20 tons per acre instead of 10. Another improvement up to date (1921) is 2 bushels of oats and no barley--total 5 bushels per acre—instead of the figures quoted in the table for mixture No. 6. Yet another is the substitution for crop No. 7 of buckwheat 1 bushel, peas 1 bushel, rape 4 lbs. This last again proved a useful standby in the wet days of last September, the buckwheat growing well with the other two on stiffish loam.

Giant rape is used, and care should be taken to sow it in a separate operation when peas, tares or rye are used, as it must not be covered deeply. Sometimes it is recommended that it should be sown at a later date for fear that it should smother the other crops grown with it, but this is unnecessary if not more than 3 lbs. is used, and if peas are sown first they—like tares—are likely themselves to smother the rape. In fact, if care is not exercised in sowing, rape may be the last crop to come up, as proved to be the case in another experiment.

For pigs, peas and rape or marrow-stem kale would seem to be the best crop, rape being inclined to give scour if used alone, or peas along with a few beans would probably answer well. The peas could be ploughed in, and the rape sown shallow. For cows, again, rape and hardy green turnips form an alternative to the latest of the cabbage breaks in the table, sown June 10th, providing keep throughout April, and thus usefully supplementing the mangel crop, which alone would normally be the only available green crop at this period.

Peas, beans and wheat sown on the furrow in mid-December in a box fitted to the plough is a further development, little growth being made till spring. It may, however, germinate badly, and comes through slowly, and quite shallow ploughing is necessary for the development of the wheat.

Maize, of course, might not be available in Northern districts, but its place can well be taken by Marrow Stem Kale, which has proved so serviceable in the college experiment, as already mentioned. A good plant of cabbage is of much importance as it is a better milk producer and more certain cropper than mangels. Very little after-cultivation is necessary, and it is found that planting out can be successfully carried out daily in an average year provided this is done directly after clearing the land. In fact it is much better to carry on with the work except when haymaking intervenes, as the moisture in the furrow slice is fresh, and immediate planting after ploughing results in much quicker rooting.

The plants must, however, be large and sturdy for this daily planting to be successful, size being an important factor in getting proper summer growth. The thin spindley plants so often seen are quite unsuitable, thick stems being a great safeguard against drought.

This ploughing in method has been found quite successful, and much less costly than dibbling, but large plants must be used ; they are laid in the centre of the furrow to get the moisture, and the distance can be regulated according to the width of the furrow. Rather thinly sown seed tends to give the succulent stalks desired, but not less than about 1½ lbs. is required to plant an acre. The first week in August is the best time for autumn sown cabbage, few of which will be ready to cut before the beginning of October.

To get a succession of early Drumheads, Winningstadts, Flat Polls, spring sown Flat Polls or Christmas Drumheads, in this order should be planted, the Winningstadts being sown in April, and the Early Drumheads and first lot of Flat Polls being autumn sown. They should then come on in October, November, December and January respectively, though the crop may not always be ready at the time required. It may, therefore, be well to leave some of them for additional growth even as late as February, as proved to be the case this year, while it has been found advantageous to cut the riper heads first.

If they are clamped, as they may be, the outer leaves should be removed. Many years ago storing in heaps with or without a layer of straw between the cabbages (head-downwards) was known to be a good way of storing this excellent plant covered with a little straw, and thoroughly ventilated, either in conical or flat heaps, but it seems to be rarely done, and doubtless by this means the lives of the flat-topped ones could be prolonged, helping to fill up the period of early spring which is the weakest link in the chain.

This method of storing preserves them from frost and thaws, and if not packed too tightly heating and fermentation are prevented, and they keep well through the winter. A very beneficial extention of this crop for dairy farming and stock rearing was also then advocated, but its fulfilment is slow. The August plants should be sown quite early in the month to get the best results, though the second week may be serviceable enough, or the young plants are liable to be checked in growth by cold nights, and the ground over-run with chickweed. Clubbing can be prevented by ground lime, basic superphosphate, or basic slag.

Savoys are stronger, and may be sown up to September, lasting from November to March. It is found that one or two horse hoeings are all that is required after planting, and even without that their heavy growth was unfriendly to weeds even in the wet summer of 1920.

The 1920 crop consisted of the cabbages above named, excluding Savoys, sown at the times given for each variety, resulting in useful stuff coming on gradually for cutting with the minimum of bolting. Though mangel has generally been depended on for spring forage there would be no difficulty in arranging for cabbage of some kind to fill in the interval, Kale preferably, and in this plant a useful development may be expected.

GENERAL MANAGEMENT.

The method is so novel in its application on a practical scale that there will doubtless be much division of opinion as to its feasibility, but up to the present there has been little adverse criticism, and it is clear to the writer who has had considerable opportunity of studying the subject at first hand that there are many points in its favour. The cows also are healthy and contented, and keep in milk longer than those on the same farm which are treated in the ordinary way.

Doubt has been expressed to the writer as to the effect of the system on the breeding qualities of the cows and enquiry has been made as to the health of the calves; but there does not seem to be anything wrong with soiling here, even as regards cows turning after service, for this trouble exists everywhere, and is no greater here, and many of the calves have won high praise from farmers who have seen them.

Both quality and quantity have been improved as regards milk, and it is estimated with confidence that 100 gallons more per annum can be produced as compared with the ordinary system. More butter fat was found during periodical tests, and moreover, excellent cheese was made in spite of some doubt being expressed in the matter. Nor is there trouble experienced in the milk being tainted in any way. Another point of interest lies in the small amount of exercise which is necessary, apparently, for milking cows, for daily watering is found to be sufficient for this purpose, and even the very restricted grazing for one hour, at first allowed (1917), was afterwards discontinued.

As regards feeding, the cows receive cake, rather than meal, all the year round, the average being about 4 lbs., the difficulty with meal being to consume it economically without chaff or pulped roots as the cows do their own cutting. This is a point of economy which results would seem to justify, but it is open to question, and some of the harder and stronger forage will probably want some preliminary breaking down. Pea and oat hay, at any rate, is easily dealt with whole by the cows, who consume it as easily as ordinary hay.

About 14 lbs. of this hay and some 80 lbs. of cabbage is found to be sufficient to maintain the winter flow of milk, which is better sustained than when on mangels. These proportions, with cake according to milk yield, seem to be about the best, the desideratum being a large supply of bulky fodder, although it is richer than the ordinary run of such food, if the milk is to be maintained.

THE EFFECT OF THE DROUGHT.

The effect of the iron grip of the weather in 1921 has naturally been felt, but the value of the system has also been demonstrated as compared with the burnt-up pasture on similar soil. The winter crops (No. 3), sown in the latter part of September, 1920, have done best as regards cereals with fine heavy crops of oats and of barley, the latter quite 5ft. in height, but the vetches and beans have felt the drought considerably.

Peas have done far better, those in crop No. 2, and in the pea and oat crop, sown in March, making a good and healthy show, and even in No. 6, sown through May in the drought, they have withstood it better than the beans, and up to the time of writing (July 1921), are generally showing their value as smotherers. The dense growth of the winter corn has left the ground clean, and after rapid germination, No. 7 is covering the ground in pleasing fashion. Dunns oats, too, March sown, have quite a luxuriant appearance, towering above the peas.

The rye and peas were edible till nearly the end of June, but the winter corn ripened fast, and demonstrated the value of a silo, if overlapping in an abnormal year is to be avoided. It seems questionable, however, if it is a paying proposition in ordinary seasons when looked upon merely as a savings bank for odds and ends of crops, as owing to the expense of working, it is more profitable to grow sections direct for this purpose.

The abnormal conditions set up by the drought might easily lead one to suppose that sectional sowings of the various crops might be an advantage, so that there would be no surfeit, but Mr. Brown is not of this opinion, as in a normal year this leads to growth out of season, and illustrates the necessity—already pointed out—of a fairly close adherence to the time-table, though this need not be rigid, and in light land districts, for example, might require some adjustment.

The cows are the best arbiters of the merits of the system, and with a daily watering they have milked satisfactorily, though with half-ripe forage there is naturally some excuse for waste, which the cows are not slow to recognize. Seven gallons daily was touched by one of the spring calvers.

CONCLUSION.

It has been already remarked that the Soiling System, being a very special line of farming, is not applicable to all kinds of land and situations, but the promoter of the scheme under review believes that even on down land and others of poor, light nature, crops could be prescribed that would flourish, and be an improvement on the proverty system now often obtaining. To some extent this has already been done.

The practical development of soiling will probably be best served by combining it with ordinary farming, and its usefulness may well lie in being an adjunct to the existing system. It is well-known to dairy farmers for example that the best of the summer grass is soon over, and that unless something is available to take its place there is soon a drop in the milk-flow. This occurs after June is over.

It is also a fact that at this, the period of greatest flow, milk is at its lowest price, whereas it is highest in winter when production is at its lowest, the intervening months striking a medium in both respects. The adoption of soiling does away with this inequality of production, and so tends to greater money returns (as well as more milk), because it is as easy to produce winter as summer milk, especially if cows can be got to calve out of season. It seems possible that this can be in time accomplished, and it is worth more consideration than is commonly given to it. It is well-known that the effect of grass in early summer is potent in producing the milk-flow at its highest, aided by the lactation influences of spring, but it is also true that the effect of calving is great at any time of the year, and if it takes place in the fall of the year, as the Leeds records have shown, it tends to counteract the depressing effect on yield of the waning growth of grass.* The full supply of green fodder in the late summer which soiling makes possible is a further aid, and indeed does away with this depressing influence, which is so generally experienced in the late summer and autumn.

And not only this. The cost of milk production under soiling is the same in winter as in spring and summer, so that the advantages of late calving are obvious, dependence on spring calving to catch the seasonal flow of milk is unnecessary, and production will tend to be at its highest at the worst time of year, when prices are highest.

Assuming, then, ordinary farming supplemented, as mentioned above, by soiling crops, these will come in as a useful side line in, say, August and September and October, when rape, maize, various mixtures and cabbage much assist ordinary grazing. Such crops, then, are quite consistent with the growth of seeds and roots in moderation, and certainly with a good breadth of grain. But the grass area can be materially reduced, and profitably so as regards hay at any rate, for pea and oat hay is much better value, and more can be grown in the same area than of meadow or clover hay.

This leads to the important reservation in the Soiling System proper, that it seems to be wise always to retain some natural pasture, for it is not contended that soiling can compete economically with grass in May and June, when grass is the cheapest food going. The soiling farmer will not, however, be so dependent on it after this period, for the reason stated.

See Bull: 84 Leeds University.

IV.—DO PLANTS EXHIBIT SENESCENCE?

By Prof. J. H. Priestley.

INTRODUCTION.

The question asked in the above title will probably find an immediate affirmative answer in the minds of many readers, but it is possible that this answer would be at variance with that usually given by the botanist to-day, and that it might well be revised in the light of further reflection.

The object of this paper is to show that in the case of certain plants the question remains an open one and that its ultimate solution may prove of great practical importance in agriculture and horticulture.

The immediate instinctive reply to the question is probably based upon our implicit acceptance of the fact that there is a natural term to human life and our ingrained habit of projecting our own experience upon the interpretation of the world of animals and plants around us. But we know, as yet, very little as to the mechanism controlling our own allotted span of life, and there are physiologists who are bold enough to suggest that we may yet greatly lengthen the proverbial three score years and ten, even if we remain unable to prevent the inevitable the succession of events by which finally our temporal period of activity is brought to a close.

If we wish to find the true answer to the question whether the plants grow old, it would be well to neglect our experience of human existence and confine ourselves at first to our experience in the garden. At first sight our instinctive assumption is strongly confirmed by the numberless examples of flowering plants that flower and fruit, then die away, leaving the continuance of their species to be ensured through the seeds they scatter around them. It is a common observation that this habit, characteristic of the annual plant, is to be associated with its production of flower and seed, and this consideration leads us to consider two further cases. First, what of the plant which we know manages to survive the ordeal of flower and fruit production, and subsequently maintain its individual existence? Many such plants are well known and comprise the majority of perennials. Have they succeeded in avoiding that ageing and death which is so common amongst the annual plants towards the close of the year? Secondly, will a plant continue to thrive indefinitely as an individual if flower and fruit formation is suppressed?

THE PERENNIAL.

We must remember that in tropical climates plants may bear foliage and grow for many years and yet many such perennial plants, when finally they produce flower and fruit, die down as individuals. Well-known examples of once flowering perennial plants are provided by some of the palms. Thus the Talipot palm of Ceylon (*Corypha umbraculifera L.*) grows to over one hundred feet in height, produces a gigantic terminal inflorescence and then dies.

But in our own country with its seasonal climatic cycle we may see hundreds of different species of perennial plants flowering annually or at frequent intervals and subsequently growing as actively as before flowering. All our trees provide examples, and we have now to consider whether they gradually age and ultimately die. Their natural span of life in any case so far exceeds our own that our answer cannot be based upon the study of the life cycle of one particular individual, but must rather depend upon the comparison of many different individuals of different ages.

We should probably incline to say that the older trees were materially less vigorous and were becoming, to use a convenient term, senescent, but we must argue from such comparisons with great care. True, the older trees seem less vigorous, but they are larger and more exposed to a relatively hostile climate and have endured longer the attacks of their natural enemies—fungus, parasites and insect pests. Their apparent senescence may only be due to such external factors, and not be the expression of internal factors inherited by the tree, which would be the case if the tree exhibited a true senescence.

It is relevant to our problem that in the same climate different species of trees survive for different periods, some being relatively shortlived and others offering striking examples of longevity. Here we clearly have an indication that internal factors are involved, but we cannot say that these internal factors alone, acting in an ideal environment, would bring the tree's life to a close within a natural term of years. Limits to existence must obviously be imposed by external conditions. It can reach no further into the ground nor support its massive crown into higher regions in the wind-swept sky. But here again the tropics supply examples that make our difficulty acute. The Banyan (*Ficus benghalensis L.*) sends out its massive branches horizontally, and these are supported over an ever-widening circumference by prop roots, which, starting from the lofty branches, reach the ground and thicken into adequate supporting pillars. Thus roots and leafy crown both cover an ever-widening territory, and it is difficult to say that such a tree, unhindered by the competition of its neighbours, should ever reach a natural limit to its activities. In India, where the trees are considered sacred, the groves arising from such a spreading tree may cover several acres.

Clearly when we follow this line of thought to its conclusion, our experience is inadequate, and we are unable to find in this direction an answer to our question—Do plants grow old ?

VEGETATIVE PROPAGATION.

To consider next the second alternative. We find on examination, cases of plants that within our experience have never formed seeds. If such plants persist, they apparently supply evidence that the individual plant may last for an indefinite period.

An interesting case is the little Canadian pond weed (*Elodea Canadensis Rich.*), now met with in ponds and streams all over the country. This plant, apparently, reached Ireland from North America about 1836. The flowers are of two kinds, staminate and pistillate, and are born upon different individual plants. Apparently the introduced plant was the female plant only, and though it has spread everywhere since, carried presumably by the wild fowl, all the plants arising from this single individual have borne only female flowers, no pollen has ever reached them, no seeds have set, and it has only propagated vegetatively. Its growth has often been most vigorous, and still seems to be so when it appears in new localities, and there is little reason to regard this plant as showing yet any signs of old age, although for more than eighty years this first introduced individual plant can be considered as growing and spreading throughout British freshwater habitats.

Cultivation supplies many much more striking cases, of which only one need be cited. The banana has been in cultivation by man since historical times, and yet the cultivated races of this plant, *Musa sapientum L.*, are not known to form seed, and are propagated entirely by separating the young shoots arising near the base of the rhizomes. Here we seem to have a clear case of a plant which to a certain extent has solved the problem of a continuous individual existence. So long as the cuttings are separated from the parent stem, the new plants, practically pieces of the original individual, may be expected to grow as vigorously as the rest of the individual from which they have been removed.

ARTIFICIALLY PROPAGATED VARIETIES.

Clearly this is a new form of the old problem, and it may be objected that we have solved the problem of continuous individual existence by re-defining the individual. The successive portions of the old individual thus removed are in a sense entirely new growths, and we might spend much time arguing whether they might truly be considered as continuing the life history of the self-same individual plant.

But the practical point of importance lies in the question whether such vegetatively propagated portions of the old individual have escaped from any oncoming senescence that may ultimately affect the tissue from which they have been separated. Although the banana appears to answer the question clearly in the affirmative, we may not assume that one plant can answer for all, and, as the assumption has recently been called again into question, we may profitably re-examine the question.

Its practical importance lies in the fact that many of our common plants of farm and garden are regularly propagated vegetatively, and many orchards of plums, pears, apples, etc., throughout the country represent as a consequence, not merely trees of one variety, but actually trees that may be regarded as all separated parts of one and the same individual tree. If then such a variety, that is, individual tree, should in time suffer from old age as a natural phenomenon, then presumably not one tree but many orchards would suffer in the same way at the same time, all the orchards, in fact, that were stocked with supplies vegetatively propagated from that same variety. The phenomenon would then be exactly analogous to that met with in the bamboo. Some species of Bambusa only flower at rare intervals, and cuttings from the same parent stock all flower in the same year.

So long ago as 1795, Thomas Andrew Knight, in the Philosophical Transactions of the Royal Society, had drawn attention to this question, when he reported his repeated failures to get vigorous growth from old trees by grafting their shoots upon young stocks. He pointed out then that many of the varieties of fruit trees familiar to the old growers had already disappeared. He drew attention to the apple, "Red Streak," described by Evelyn, and raised from seed by Lord Scudamore about 1634. Knight, writing from Elton, Herefordshire, reported that the many trees of this variety known to him had been in a state of decay during the last forty years. It would be interesting to know the subsequent fate of this variety if it could be ascertained.

Since Knight's time the question as to the durability of vegetatively propagated varieties has frequently been discussed.

Professor Möbius (Fortpflanzung der Gewächse Jena, 1897) published a very full review of the literature, but the general impression it leaves is that the question is still unsettled. Until now one great difficulty has been the lack of accurate information as to the true age from seed of any of the varieties introduced into commerce.

From this standpoint we must welcome the initiative of Mr. Edward A. Bunyard, of the firm of Messrs. G. Bunyard & Co., Ltd., Maidstone, in establishing a Journal of Pomology, in which careful analyses of current varieties of many of our common fruits frequently find a place.

We may also hope that the growing association between genetic research and the practical work of the commercial plant breeder may lead to a careful record being maintained of the early history and subsequent fates of varieties now being placed upon the market. Such records may enable this question to be answered definitely at a later date and a definite answer will be greatly in the interests of horticulture. In the meantime we turn to a brief discussion of some recent experimental work that emphasises the need for a close study of this question.

BENEDICT'S WORK UPON THE GRAPE VINE.

In June, 1915, the Agricultural Experiment Station of Cornell University, published a paper by Harris M. Benedict, which seems to open up new avenues of experimental attack upon the subject. Although studying other plants in addition, Benedict devoted most of his attention to the wild grape (*Vitis vulpina, L.*), native in the districts in which he worked. He examined plants of different ages with very great care so as to analyse the differences between them and so discriminate between effects due to external factors and differences dependent upon internal and possibly age factors.

His studies were extremely elaborate, and appear to have been made with very great care. They led him to the remarkable conclusion that in the vine certainly, and probably in other plants also, there was a leaf character that provided an obvious indication of the age of the plant. This factor was found in the relative size of the little area of soft green tissue surrounded by the ultimate branchlets of the veins. Benedict terms this little green area a "vein islet." Its size was found to be independent of the size of the leaf or its position upon the plant and relatively little affected by external factors, but with increasing age the individual areas of these leaf islets became progressively smaller. Put in another way, with increasing age there was a tendency for fresh branchlets of the veins to form, and, intersecting the original leaf islets, sub-divide them into even smaller areas.

In the earlier years of the vine's growth this progressive diminution in the size of the vein islet proceeds most rapidly, but it if still detectable as a tendency with vines between 50 and 60 years old.

Benedict points out that this indication of age can be estimated by a simple method in the field. Using a paper clip with broad parallel sided jaws, two marks a definite distance apart are scratched upon this, the clip is then closed upon the leaf tissues at various points between the main veins and counts made of the number of veins held in the clip between the two engraved marks. The average of a number of such counts will enable a rough estimate to be formed of the age of the leaf, as the smaller the vein islets the larger the number of veins met with in the given length.

If further work should confirm Benedict's observations,* the matter will become of great practical importance, because the area of green tissue present in the vein islet represents the real vigorous food manufacturing area of the leaf. The veins intervening represent rather channels of supply than areas actively engaged in food construction, and their increase in area at the expense of the tissue of the vein islet, may be expected to mean actually a less efficient leaf. So far as Benedict's experiments went they support this conclusion, and the leaf of the older plant with the smaller vein islet represents, area for area, a less efficient constructive tissue. Clearly then, if this work holds good, its extension permits us to hope for the time when we may gauge by suitable method not only the age but the efficiency of the variety, as compared with the new ones coming on in the propagating nursery, and thus be provided with material for the decision as to the time when the old variety must be scrapped and replaced by others more vigorous because more recently raised from seed.

SOME EXPERIMENTS UPON ROOT PROPAGATION.

Influenced by Benedict's interesting work, the writer was led to try and approach the problem from another angle in connection with his own experimental work, but so far with little result.

In conjunction with Miss Freda Evershed a quantitative study has been made of the regeneration of root upon cuttings of Tradescantia and Tomato, when grown under very uniform and standard conditions. The result has been to show that, especially with

---

* A recent paper, by Ensign (American Journal of Botany 8, 443-441, 1921), criticises Benedict's methods of estimating the area of vein islets. This did not reach the author until this article was in the press.

Tradescantia, a given original weight of cutting could be relied upon when under constant conditions, to form a certain weight of roots within a specified time. That is to say, under these conditions, the amount of root developed upon the cutting might be regarded as settled by an internal factor. If then cuttings of different vigour were taken, this difference in vigour might be expected to show itself in differences in amount of roots formed. However, the age of our Tradescantia plants could not be determined, all our tomatoes were from seed, and so far the suitable plant for testing this standpoint thoroughly has not been found. Either the shoots for propagation cannot be obtained, which are of definitely ascertainable different ages, or the shoots of different ages have been of plants not capable of producing roots inder such carefully standardised conditions as we could compass.

Currant shoots root vigorously under suitably standard conditions, and a trial with shoots kindly supplied by Professor Barker, from the National Fruit and Cider Institute, Long Ashton, certainly showed great differences in quantitative root production, fairly uniform within the variety; and with the two varieties of red currants carefully tested, the younger variety produced the greater weight of roots within a specified time. But the trial needs to be made with the same variety, with shoots obtained from seedlings raised from this variety in different years. With different varieties of widely different history, so many factors are involved that a direct age comparison cannot justly be made. In the meantime, these early experiments led, through a consideration of their various failures, to the exploitation of another possible avenue of attack.

EXPERIMENTS WITH POTATOES.

In these later experiments we were led to examine the capacity that a plant shows to heal an exposed cut surface. It would take too long to retrace the chain of argument by which we were led to anticipate that another indication of the vigour of a plant, in addition to its capacity to form roots, would be provided by its capacity to heal a wound, but a study of the process carried out with the help of Miss L. M. Woffenden, M.Sc., has gone far to prove the correctness of this assumption.

Potatoes proved difficult plants to use for quantitative comparison by means of root propagation from isolated shoots. The formation of roots was always an uncertain phenomenon, and frequently the food supplies of the isolated stem were used instead in producing small lateral tuber-bearing shoots. But it proved possible to institute quantitative comparisons between potato varieties as to the capacity of the tubers to heal cut surfaces.

When a tuber is cut across, as when potato sets are being made, a flow of sap takes place to the injured surface. Here the water evaporates and the substances left behind at the surface oxidise in the air and otherwise change chemically, forming a deposit of brownish tint, composed largely of chemical derivatives of fatty substances. This deposit is frequently termed suberin. The extent, completeness and rapidity of formation of this layer is a very important matter, as it provides a water-tight covering preventing further rapid loss of moisture from the tuber, and is also a protection against the entrance of disease-producing organisms.

Under normal conditions, if the air is not too dry, the production of a continuous layer of suberin from the sap covering the exposed surface is complete within a period of from twelve to forty-eight hours, and it is practically impossible to estimate quantatively the difference in its rate of formation in different varieties.

When this layer of suberin has formed, the sap still accumulates beneath the blocked surface, and, as a consequence, the tissues beneath spring into activity, growth takes place in them and this activity is manifest in the formation of a number of fresh layers of cells, the outermost of which form the new layer of cork beneath the injured surface. The cells thus arising are easily distinguished under the microscope, because they form continuous regular rows and the number of rows is easily counted. Observation showed that within a given period of time, under uniform conditions, the average number of rows formed below the cut surface in a particular variety of potato was extraordinarily constant. We were thus provided with another method of quantitative comparison of internal vigour between one variety and another, and a number of observations have now been made with the aid of students in the Botanical Department at Leeds, which show that under constant external conditions, the internal factors responsible for this formation of cork, vary remarkably from one variety to another. Further observation has shown that the tubers for comparison must be lifted and stored under identical conditions, as potatoes which have recently been lifted are much more vigorous in the formation of suberin and the subjacent cork layers than potatoes long in store.

The quantitative comparison of varieties with one another as to cork formation does not permit of their being placed in a series which is indicative of their age from seed, thus some numbers are given for early or second early varieties in the accompanying table (page 54), and such data as are available as to the time of introduction are also added. But senescence, if present, will only be one internal factor of many, in varieties of widely different origin, and so far we have failed to obtain for comparison potatoes of an old variety, together with tubers relatively recently raised from seed derived from the same variety.

TABLE

Showing number of layers of cork cells formed by different varieties of Potatoes, upon the cut surfaces of tubers after six days' exposure under similar standardised conditions. All tubers were lifted at the University Experimental Farm, Garforth, upon the same day from a plot of ground six yards square. Twelve tubers of each variety were employed, and the results given are the mean of several countings from each tuber.

Variety.	Number of Layers of Cork Cells.	*Approximate year of introduction.
Ashleaf	3 Poor, irregular	1868
Epicure	4–5 Very even	1897
Eclipse	5–7 Good	1912
Sharpe's Express	7–9 Excellent	1901
Dargill	7–9 Good, very even	1907
Resistant Snowdrop	5–6 Even	1883
Midlothian	5 ,,	1904
Arran Rose	4–5 ,,	1919
Witchell	3–5 ,,	1912
British Queen	3–4 Poor	1899
Arran Comrade	3–4 Not good	1919
Edzell Blue	7–10 Very good	1897

(The writer has to thank Mr. R. W. Cheveley for help in obtaining these data).

* This column is based upon J. Fraser, "Twentieth Century Potatoes." Cable Printing and Publishing Company.

A recent discussion of this subject before the Agricultural Education Association at Edinburgh, suggests, however, that this line of work is in any case worth following: it seems likely to provide valuable data as to the best conditions under which to make potato sets, and also the indications given as to the capacity of a tuber to heal a wound by natural means will probably throw valuable light upon its capacity to resist some forms of disease. With these ends in view, it is hoped to continue the experiments, although for lack of suitable material the original aim of the experiments, the obtaining of data as to the existence or non-existence of senescence in these vegetatively propagated varieties, may have to be dropped.

In conclusion, brief reference may be made to some experimental results obtained in the effort to turn a flowering plant with a naturally brief life cycle into a perennial.

An Artificially Produced Perennial.

For the purposes of these experiments a little chickweed (Stellarin media Vill.) abundant as a weed in the University greenhouse at Weetwood Hall, was chosen for experiment.

This little plant has usually germinated, flowered and produced seed, several times within the summer months, but by careful removal of the flowers as they developed it was possible to keep the plant growing onward, and in the winter of 1921 we have large straggling masses of individual plants that have been growing continuously since the summer of 1920.

Cuttings from these little Stellaria plants, if placed in water culture solutions, rooted freely, and in 1921 an experiment was started to see whether the cuttings from seedlings rooted more vigorously than the cuttings from the vegetatively propagated plants.

On July 13th, Miss Woffenden took 75 cuttings from plants grown from seeds planted on March 4th, 75 cuttings were also taken from five straggling plants, we may call A, B, C, D and E, which had been spreading vegetatively since August 1st, 1920. The cuttings were all of the same weight (0·15 gram.).

On July 27th, 70 out of the 75 cuttings from seedlings were well rooted, but only 31 out of the 75 cuttings from the vegetatively propagated plants. This was a very striking difference, and a closer analysis of the results from the vegetatively propagated plants makes it more striking still.

Thus of the 75 cuttings from the vegetatively propagating plants—

	Of	15	from	Plant	A,	1	had rooted.
	,,	30	,,	,,	B,	14	,,
	,,	5	,,	,,	C,	0	,,
	,,	15	,,	,,	D,	14	,,
	,,	10	,,	,,	E,	2	,,
Total	...	75		Total ...		31	

These analyses of the root production show that whilst two of the plants still rooted well when shoots were removed, three others had nearly lost the power to produce roots. This observation seems of considerable interest, and the value of the experiment is not lessened by the fact that further investigation has shown it possible to correlate power of rooting with certain ascertainable structural features, and that this observation has suggested a method by which it is possible by experiment to restore the power of rooting to the shoots of the plants which appear to have lost it. To follow these observations and experiments further would make this paper too long, but it is hoped that this brief statement of the results obtained shows that experiments along these lines open up fascinating fields of investigation.

CONCLUSION.

It is upon that note it is desired to end. The interesting observation of Benedict and our incomplete observations show that the problems of senescence in plants are wide-ranging in their practical significance, and from whatever angle they are approached they seem to open up new avenues of investigation that will prove valuable to the student who may be privileged to follow them.

Our own observations upon senescence have only been rendered possible through a grant to that end made to the University of Leeds in 1920–21 by the Ministry of Agriculture and Fisheries. This grant has not been renewed, and the pressure of other and more immediate problems and still more the great difficulty experienced in obtaining suitable material of vegetatively propagated plants of definite pedigree may prevent much progress being made with the problem for some years to come.

However, even this incomplete survey of the field shows that as a result we are left with outstanding problems of immediate practical interest, notably problems connected with the healing of wounds in plants, with the conditions under which potato sets are made, and the internal factors responsible for root production when shoots are propagated vegetatively. Some, at least, of these problems it is hoped to elucidate so far that their solutions may prove a definite contribution to agricultural and horticultural practice. If this proves to be the case, we may at least conclude that time spent in reflection over some of the more ultimate problems provided us by the plants we cultivate, may not be wasted, but may prove to be time spent in a pursuit that is not only fascinating but profitable.

V.—SOME IMPORTANT INSECT PESTS OF STRAWBERRIES.

By Herbert W. Miles, N.D.A., Dip. Agr. Hons. (Harper-Adams).
(University of Bristol).

INTRODUCTION.

With the increased cultivation of strawberries in such localities as the Cheddar and Tamar Valleys, more attention will be paid to the insect pests which select the strawberry as their host, and in the course of the year's work on the plantations, growers will be certain to find some of these pests causing more or less serious injury to their plants. In view of this, some observations on the habits of some of the more important pests, the nature of the damage they do, and a review of the control measures, if any, may be helpful in some small way in assisting growers to identify and combat such insect enemies. During the past two years certain pests have been observed both in Gloucestershire and at Long Ashton; particular attention will, therefore, be paid to these, as being most likely to occur in other parts of the West and South-West of England.

KEY FOR THE IDENTIFICATION OF THE CAUSAL INSECT FROM THE NATURE OF THE DAMAGE.

A.—*Damage to Roots.*

1.—Roots bitten through completely near crown, rind scaled of main roots in large irregular patches—*CHAFER LARVÆ.*

2.—Roots bitten partially through anywhere in their length, shallow gnawings at base of crown—(i) *WEEVIL GRUBS,* (ii) *WIREWORMS.*

3.—Roots and crown damaged superficially, with deeper gnawings near soil level—*CUTWORMS (AGROTID LARVÆ).*

4.—Roots tunnelled, with tunnels continuing right into the crown—*SWIFT MOTH LARVÆ.*

B.—*Damage to Foliage.*

1.—Leaves dragged down into the ground and eaten away in ragged patches—(i) *CUTWORMS* (ii) *LEATHER JACKETS.*

2.—Leaves eroded in circular or semi-circular manner from the edges—*LEAF EATING WEEVILS (PHYLLOBIUS or OTIORRHYNCHUS).*

3.—Young folded leaves eaten in irregular or circular holes, leaflets fastened together by strands of silk—*TORTRIX MOTH.*

4.—Young folded leaves infested with Green Fly—*STRAWBERRY APHIS.*[1]

C.—*Damage to Flower.*

1.—Stalks of young flower buds, partially severed and drooping from pointof injury—*BLACK ANTHONOMUS WEEVIL.*

2.—Petals eaten away very irregularly—*LEAF EATING WEEVILS.*

3.—Young flower buds with holes through petals into interior, stamens damaged—*TORTRIX MOTH.*

D.—*Damage to Fruit.*

1.—Fruits in all stages of growth eaten in shallow irregular patches—*LEAF EATING WEEVILS.*

2.—Fruits with penetrating round holes, often containing small shining black weevils—*SMALL STRAWBERRY WEEVIL.*

STRAWBERRY PESTS—THEIR HABITS AND LIFE HISTORIES.

THE COCK CHAFER—*Melolontha vulgaris* (Fab.). The larvæ, or "white grubs" of the cock chafer are well known as pests of strawberry, raspberry, and even young trees; they are persistent root feeders and do considerable damage.

The life history is as follows. The eggs are laid in the soil at a depth of two to eight inches below the surface, the depth depending probably on the nature of the soil. They are roundish and vary in colour from white to yellowish, being usually laid in clusters, sometimes as many as eighty together. The grubs which hatch from these eggs are whitish, having a light brown head with strong biting jaws, six brownish legs, one pair to each of the first three body segments, and a distinctly segmented abdomen. In the young stages the larvæ are very active, feeding voraciously on roots and any available vegetable matter in the soil. In feeding they bite through the finer roots entirely and gnaw at the coarser ones and at the base of the crown, causing firstly wilting and then withering, and, finally, the whole plant dies. Having exhausted the food store of one plant these grubs proceed through the soil to another, and continue their feeding processes, again destroying the plant. Three or four consecutive plants in a row may be attacked and destroyed in this way, so that should withering and drying up be noticed in plants close together and examination reveal the injury as indicated, the cause will most probably be chafer grubs, and search should be made in the soil surrounding the injured plants for the offenders, which can be easily found, when present, and destroyed. As growth goes on the grubs become more and more fleshy until, finally, after about three years of more or less continuous feeding, they measure from 1¼ to 1¾ inches in length. By this time their bodies are so swollen and distended with fat that the tail end of the abdomen cannot be carried along dorsi-ventrally but has to be dragged along, lying permanently on its side. When turned up out of the soil at this stage the grub is slow and ponderous in movement and will often remain helplessly lying on its side in a semi-circular position.

In the autumn or spring, after being fully fed, the grubs work their way down deeper into the soil, often to a depth of two feet, and construct rough earthen cells in which to pupate. The pupæ are at first yellowish, and through the pupal coat the outlines of the perfect insect can be seen. Gradually the pupae become light brown in colour, from which, just prior to the emergence of the adult, they pass to darker brown. The adults may emerge in the autumn and remain inside the cells during winter, or may not emerge until May or early June, when they work their way up through the soil into the open air. During daytime the adult chafers are sluggish, sheltering in thick foliage, clumps of grass, and the like. They are not restricted in any way as regards feeding habits, freely eating the leaves of forest trees, fruit trees, and bushes. Towards dusk they become active and take to the wing, the dull droning of their flight being very characteristic and very commonly heard about trees at twilight. They are attracted to light, which suggests a method of trapping, when serious outbreaks occur, viz., by means of light traps, which could be placed about at nightfall in areas known to be frequented by the chafers.

The female can be readily recognised by her ovipostor, which protrudes beyond the tip of the elytra, or wing covers. The following is the description of the adult cockchafer, as given by Theobald* (10): " Its head and thorax are black, the elytra or wing cases, reddish brown, each elytron, with four raised lines, running longitudinally, the elytra are hairy and do not entirely cover the abdomen ; on each side of the body are alternate black and white patches ; the legs are brown and hairy and the front tibiæ have two spines near the apex ; the body of the female ends in a horny ovipositor ; the antennæ end in seven leaf-like lamellæ in the male, six in the female ; these plates open and close up like a fan."

Control Measures.—The adults should be collected and destroyed wherever seen. Where plants are attacked in the beds the grubs should be sought for and destroyed. Pricking in soot and lime has been advocated as giving some relief, and " Vaporite," according to Theobald, " may be safely recommended."

---

* **For list of references see page 72.**

THE ROSE CHAFER—*Cetonia aurata* (L.).—The life history of this insect is very similar to that of the Cock Chafer, the eggs being laid in soil which contains abundance of organic matter, such, for example, as prepared garden soils; here they hatch and the larvæ feed on the organic matter for a considerable time, varying up to three years. They are general feeders and will attack any roots they chance to come into contact with in the course of their development. According to Ormerod (5), "when full grown the maggots are upwards of an inch and a half in length, thick and fleshy, of a whitish colour, with an ochreous head, armed with strong jaws; the three pairs of short feet are rusty orohreous colour, and the hinder portion of the grub or maggot, is enlarged, curved towards the head, and of a lead colour." These grubs can be distinguished from those of the cock chafer by the fact that they possess transverse series of rusty coloured hairs, which facilitate movement through the soil. Moreover, their feet are pointed at the tips, while those of the cock chafer are rounded.

The adults are various shades of golden, bronze, and green, and are probably amongst the most beautiful of our British beetles. They are said to feed on the flowers of strawberries, probably destroying the stamens.

Control Measures.—As suggested for the preceding pest, forking out and destroying the grubs, and destroying the adults whenever observed, would be helpful. Theobald suggests that in "dealing with strawberries it is advisable to give up the practice, as far as possible, of putting grass and long manure under the plants," since this attracts the adults for egg-laying.

WIREWORMS.—There are two species of wireworms which attack the strawberry, viz., larvœ of *Agriotes obscurus* (L.), and of *Athous hœmorrhoidalis* (F.). Wireworms are yellowish in colour, with often traces of brown at the junctions of the body segments; their skins are smooth, polished and tough, bearing a few scattered hairs or bristles. The Athous type is darker in colour and not so slender as the Agriotes wireworms, and has the last body segment slightly produced into two points, giving it a bifurcated appearance, as distinct from the single pointed caudal segment of *Agriotes obscurus.* Wireworms hatch from eggs laid in the soil by the female click beetles, in June and July, and, according to A. W. Rymer Roberts (8) live for as long as six years. During the first two years the young wireworm is scarcely noticed, and probably does little serious damage, but by the time it is three, four or five years old it will attack and often seriously injure many plants, feeding very widely, for, as Curtis (1) states, "it will feed upon corn, turnips, mangelwurzel, potatoes, grass and cabbages, as well as upon the roots and stems of the choicest flowers."

The attacks on the strawberry, as in most other cases, consist of the destruction of the roots. In the case of potatoes and tomatoes there is a special form of injury, for the wireworms bore into the stem and then tunnel upwards for several inches.

Wireworms are very hardy and can stand considerable variations in climatic conditions, continuing to feed, in spite of hard frosts, all through the winter, and can often be found after repeated frosts within the top few inches of the soil. They have been found thus in Shropshire, Gloucestershire and Somerset, but in some districts evidence points to their burrowing down deeper into the soil during very cold weather. One factor which influences the distribution of wireworms to a considerable extent is that of moisture. Although they do not, as a rule, frequent water-logged or very wet land, they flourish in soils which are fairly moist and contain much humic or decaying vegetable matter. Should the soil be worked and stirred into a soil mulch the rapid drying out of the moisture makes the conditions unsuitable, and many wireworms will perish through dessication. Moreover, the tillage operations will, by constantly turning them up, render them liable to be attacked by birds foraging to feed their nestlings. Thus it will be seen that the old method of including a bare-fallow in the rotation was quite sound from the point of view of keeping down wireworm infestation. When mature, the wireworm goes down deeper into the soil and makes a rough cell in which it pupates, the pupa being firstly whitish and soft, gradually hardening up and darkening until, finally, the adult click beetle emerges. The adult does not immediately leave the cell, particularly if emergence has taken place in autumn, but will stay therein for some time or until the spring, when, about April, it works its way to the surface where it can be found in the first inch of soil, under stones or clods, or feeding on the leaves of plants.

Control Measures.—Little good is usually obtained by means of soil insecticides, though preparations of naphthalene have been advocated from time to time as giving good results. In strawberry beds, perhaps, the best method is to prick in a dressing of superphosphate, getting it well incorporated with the soil around the roots. This creates an irritant area which the wireworms seem to dislike; any wireworms turned up when forking over should, of course, be destroyed. Ormerod suggests that tame birds, such as rooks or sea-gulls, would be very useful in searching over the beds for the various of soil insects; the jackdaw is very partial to wireworms, and where it feeds among the beds, in winter, should never be scared away.

WEEVIL GRUBS.—The grubs of many species of weevils pass the winter feeding at the roots of plants ; of these, four at least are well known to feed at strawberry roots.

These are: The Red Legged Weevil (*Otiorrhynchus tenebricosus* (L.) ; the Raspberry Weevil (*O. picipes* (Fab.) ; the Vine Weevil (*O. sulcatus*) Fab.) ; and the Oblong Leaf Weevil (*Phyllobius oblongus* (L.). The larvæ, or grubs, of these are all wrinkled, legless, curved, whitish coloured, and fleshy. The head is brown and polished, with dark, strong, biting jaws. They are often provided with stiff hairs or bristles, which assist them in moving about in the soil. Specimens of these grubs may be turned up as early as September, and may be found constantly all through the winter. When fully fed they make rough cell-like cavities in the soil, and after a period of quiescence, change into the pupæ, which are whitish or cream in colour, and have an outer transparent skin or envelope through which the folded limbs of the adult can be seen. After a time this outer skin splits and is shed, the adult hardening up and gaining the normal shape and colour, after which it may stay in the cell for some time, before pushing its way up to the surface, where it feeds, on the young portions of the unfolding leaves or buds, eating out irregular patches of tissue. Later, when the flower buds begin to open out, the weevils feed on the petals and stamens, and, later still, when the fruit is developing, they attack it, eating out shallow irregular areas. The *Otiorhynchus* weevils are all dark, black or clay coloured ; the abdomen is ovate ; the rostrum, or beak, short and stout, bearing the elbowed antennæ, or head-feelers, at the tip. *Phyllobius oblongus*, on the other hand, has the abdomen distinctly oblong, the thorax is very dark brown, and the abdomen very light brown, clothed with yellowish hairs. When disturbed these weevils all fold their limbs and head feelers in close to the body, and fall to the ground, when they are often most difficult to locate, their colour harmonising so well with the colour of the soil.

Control Measures.—At present very few effective methods of control are available, and in the absence of anything directly remedial, the best plan is to destroy the grubs when turned up by digging and forking in winter and spring. Where soil fumigation with carbon-disulphide cannot be followed, Theobald advocates the forking in of a mixture consisting of 1 pint of carbolic to one bushel of ash, or naphthalene and fine ash, at the rate of 1 to 10.

Spraying with arsenate of lead at the rate of 4 lbs. of paste to

100 gallons of water, about 14 days before the opening of the flower buds, would kill the adult weevils and so prevent egg-laying. As an extra safeguard it would be well to spray a second time immediately the flowering period is over.

THE BLACK ANTHONOMUS OF STRAWBERRY BLOSSOM WEEVIL—*Anthonomus rubi* (Herbst).—This weevil is becoming increasingly destructive to strawberries and raspberries, and its method of attack is such as to render identification easy.

The adult is small and black, clothed with scanty greyish pubescence, it has a long snout or trunk bearing, about halfway along, a pair of slender elbowed antennæ. The winter is spent in the soil, in curled, dead leaves, in hedge bottoms, and in rough herbage. In the spring the adults leave these sites and feed on the young leaves and buds, later they pierce holes in the flower buds with the rostrum and deposit their eggs amongst the stamens, one to each bud. The female then crawls down the stem for a short distance below the bud and cuts it partly through, so that the weight of the bud causes it to droop over. This action prevents the petals from opening and the flower from developing in the normal way, so that the petals form a protective covering for the young grubs, which hatch in from eight to ten days. These white, legless grubs feed on the pollen in the lobes of the stamens, completely destroying them. When fully fed they remain quiescent for a few days and then change into the pupæ, emerging as adult weevils in a fortnight or three weeks. The young adults feed for some time on the leaves before seeking winter quarters.

Control Measures.—The spraying advocated for the leaf-eating weevils will probably be effective here, poisoning the weevils before egg-laying is commenced. If, however, it is seen that blossoms are attacked, the beds should be gone over systematically, and all infested buds picked out and destroyed by burning.

In America (3) good results have followed the application of a mixture of powdered sulphur and lead arsenate, at the rate of 5—1. This powder is applied by means of a hand sifter just before the blossom trusses are expanding, the buds being well covered; this method gave results as follows:—

Control Plot	26·2%	buds attacked.
Dusted Plot	6·5%	„ „

THE SMALL STRAWBERRY WEEVIL (*Exomias araneiformis*) (Schrank).—Theobald gives an account of this small, black or dark brown weevil, and mentions attacks on strawberries in Kent. During the summer of 1921 odd specimens of it were found at Long

Ashton, though no apparent damage was noticeable. As far as is known at present, it is the adult which is injurious, eating away portions of the fruit either ripe or green. It eats holes into the fruit, often remaining to feed during the daytime inside the cavities thus made. It is a small, somewhat shining, black or dark brown,. pear-shaped weevil, with elbowed headfeelers, borne at the tip of a short stout rostrum.

Control Measures.—Theobald was able to trap this weevil " by putting down large pieces of damp bark with moss on it between the rows." In the absence of any definite treatment this method is certainly worth a trial, when an attack is seen to be developing.

LEATHER JACKETS.—These well-known larvæ of the crane fly or " Daddy Long Legs " (*Tipula oleracea* L.) may cause great injury to strawberries, particularly where they are grown within about two years of the ploughing out of leys, or " seeds." The female lays her eggs from June to October, depositing them either singly or in little batches, selecting sites where there is abundance of dense, moist, herbage. She is confined in no way, however, to these sites, if we judge by the distribution of the larvæ, which can be found in a great variety of situations and soils, even in some of the drier types. The larvæ are soft, greyish coloured, legless grubs or maggots, pointed towards the head and blunt at the tail. They fed on any available vegetation for a period varying in duration up to nine months, when, at maturity, they may measure 1¼ inches in length. During the night they commit most of their ravages, coming up out of the soil and feeding on the stems and leaves of plants, returning to the soil during the day time, often dragging portions of the leaves down into the soil with them, and thus continuing to feed during the day. When attacking the strawberry it was noticed that during the day the leather jackets were located from one to three inches deep in the soil, where they were feeding on the roots. Towards evening they came up to the surface, and, biting through the stems, fed on the leaves, and when these were consumed attacked the crowns, utterly destroying the plants. The fully fed larva penetrates six inches or more into the soil and changes into a brownish pupa, or chrysalis, remaining quiescent until just prior to the emergence of the adult fly, when, by means of downward pointing bristles on the body, it works its way upward until it projects for a short distance out of the soil. The pupal case now splits and the long and slender legged adult escapes, its emergence being facilitated through the lower portion of the pupal case remaining gripped by the soil. Mating takes place almost immediately on emergence, and egg-laying quickly follows, as shown.

by Dr. Rennie (7). Infested land will, therefore, be frequently re-infested by the speedy ovipositing of those females which may not seek more suitable sites.

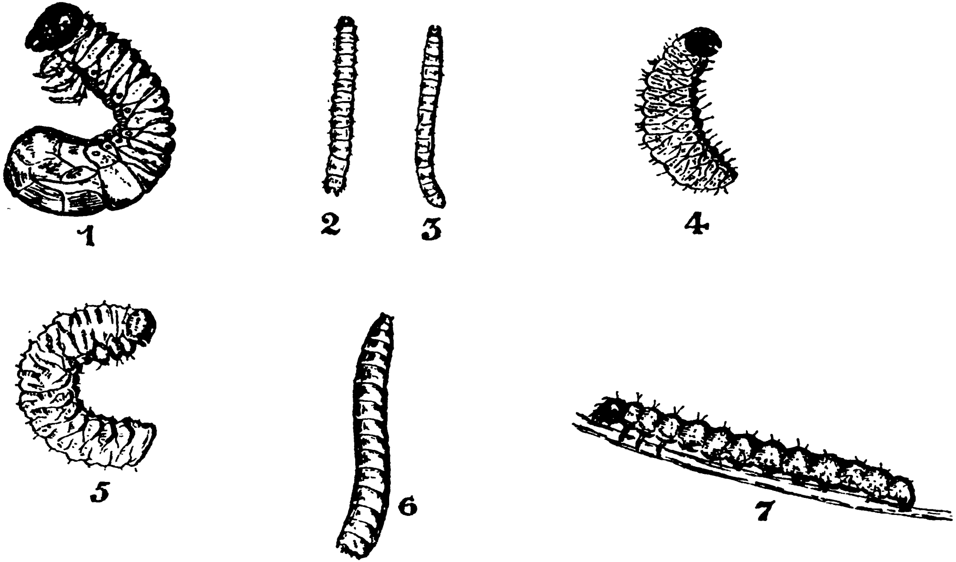
In the Midlands, the West and the South-West of England, two fairly well marked broods of flies occur, the first from April to the end of May or beginning of June, and the second in September and October.

Control Measures.—All rough grass and weeds along hedge sides or headlands should be kept down so as not to attract the adult flies to the vicinity of the strawberry beds. Where an attack by leather jackets is in progress a farm cart of the usual wide-wheeled type, should be drawn up and down the beds, the wheels running in the spaces between the rows. This should be done very early in the morning and again late in the evening: the result is two-fold, firstly, any grubs on the surface or in the top inch or two of soil are crushed, and, secondly, the soil is consolidated so that movement for the grubs becomes very difficult.

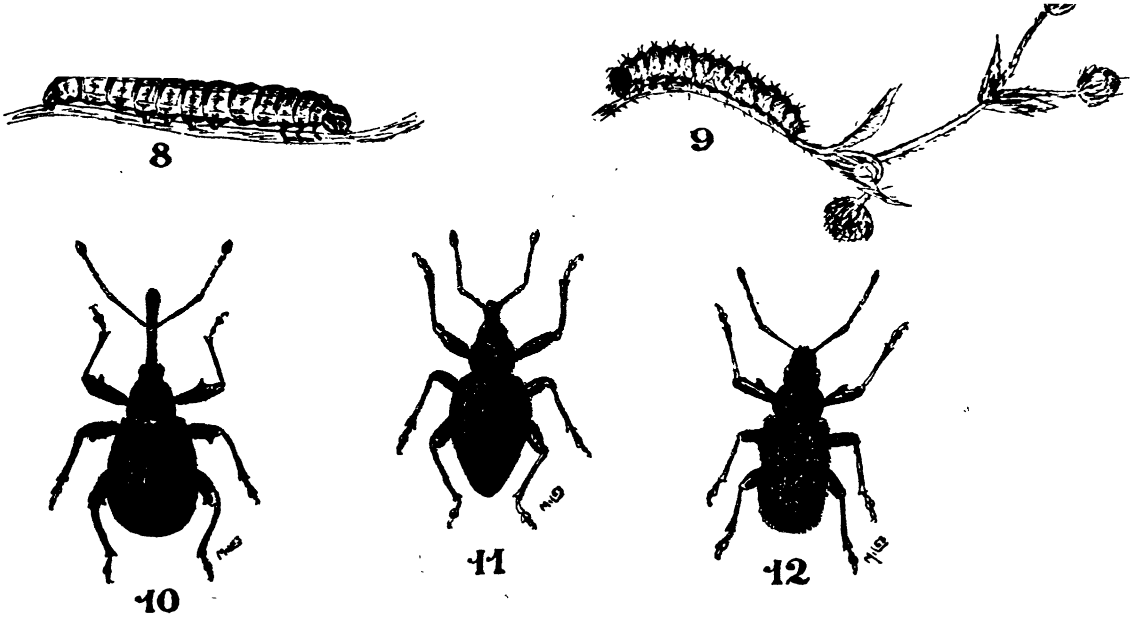
Now during the day the top two inches of soil should be well hoed or raked into a fine tilth, which will get hot and dry. The leather jackets are now confined to the lower consolidated soil; should they come into the surface layer, the hoeing will turn them up and the dryness and heat will soon kill them if birds do not. Soil insecticides, such as Vaporite, etc., have been known to give relief in some cases, and gaslime, when it contained calcium sulphocyanates, was a universal remedy. Various forms of lime have been advocated from time to time, but no general remedy seems to be forthcoming.

CUTWORMS.—Under this heading are included the larvæ, or caterpillars, of two species of moth, viz., *Agrotis* and *Hepialis*, which are often found doing considerable damage to strawberries during the winter. The Argotid cutworms are dark brown, or mottled brown and grey; they measure, at maturity, about one and three-quarter inches in length.

They develop from eggs laid at dusk in June and July on low-growing plants. When quite young the larvæ feed on the plant, on either upper or lower surfaces of the leaves, but, as they get older, they spend the day concealed in the denser growths near the ground, or take to the soil, coming out at night to feed on any available vegetation. With strawberry plants the attack may be at the ground level on the root stock and the crown, or above the ground on stems and leaves. The larvæ feed all through the autumn and winter, and, pupating in the soil in April or May, they emerge as perfect insects about a month or so later. Theobald's description of the



1.—White Grub—Chafer larva (natural size).
2.—Wireworm—*Athous Sp.* (natural size).
3.— „ —*Agriotes Sp.* (natural size).
4.—Larva of *Otiorrhynchus Sp.* (×1⅓).
5.—Larva of *Anthonomus rubi* (×5).
6.—Leather Jacket—larva *Tipula oleracea* (natural size).
7.—Larva of Swift Moth (natural size).



8.—Larva of *Agrotis Sp.* (Cutworm) (natural size). 9.—Larva of Strawberry Tortrix Moth (×2½).
10.—Adult—*Anthonomus rubi* (×7). 11.—Adult—*Eromias araneiformis* (×7).
12.—Adult—*Phyllobius oblongus* (×4).

Heart and Dart Moth is as follows: "The moth is brownish to almost clay-coloured, the fore wings with darker markings, one being almost kidney shaped, one dagger shaped, and darkened towards the edges; the under wings of the male are almost pearl white, of the female brown."

The larvæ of *Hepialis lupulinus*, L., the Garden Swift Moth, are aften most injurious to strawberries. The eggs are laid in May and June, being dropped by the females as they fly over the ground. Hatching takes place in about nine days, the young larvæ at once going down into the soil. Here they feed on vegetable matter and roots of plants, feeding and growing until the following April, when they pupate.

Theobald mentions their mode of attack on strawberries, thus:—"They attack this fruit plant first of all, by eating the rootlets, and later they tunnel right up to the main roots, and even into the crown. By so doing they entirely destroy the plants." An attack of this nature was observed in the beds at the Research Station, Long Ashton, in the autumn of 1921; the plants, on examination, showed tunnels of various sizes penetrating right into the crowns, and the sickly, withering and dying plants could be easily seen in the beds.

The mature larva is whitish cream in colour, with a hard horny, polished brown head, partly drawn into the first body segment, and six short, brownish legs, two to each of the second, third, and fourth segment.

Pupation takes place in the soil with or without a rough cocoon of soil particles spun loosely together with silken strands. The pupæ are firstly light brown, gradually darkening as the adult develops; they are about three quarters of an inch in length. The adult moth emerges in about a month. It has the fore wings light brown and creamy in colour, being darker in the anterior region; the underwings are very pale brown, the wing expanse is from one to one and a quarter inches.

Control Measures.—Numerous suggestions have been forthcoming from time to time regarding control measures; great variations occurring in the results, which are at one time very satisfactory, but at another time a total failure. The following substances have been recommended: Soot, Lime, Gaslime, Wood Ashes, Kainit, Muriate of Potash and Vaporite.

The beds should receive trequent light forkings or hoeings and all injurious larvæ turned up should be destroyed; some of the above insecticides might be worked in at the same time. Trapping in turves placed grass-side downwards on the beds has been found effective; the turves should be examined every morning and the cutworms thereunder collected should be destroyed.

Bran poisoned with lead arsenate or Paris Green is a well known and widely used American remedy. According to Gibson (2):—"The bran is moistened with sweetened water and the Paris Green dusted in. The bran must be well moistened so that the poison will adhere to practically every particle, but it must not be made into a mash so as to prevent it crumbling between the fingers. The formula is one gallon of water, one pound of sugar, and one pound of poison per 100 pounds of bran. This mixture is scattered in little crumbs between the plants and the rows in the evening, so that it will still be moist and attractive when the cutworms come out to commence their depredations. Fifty to a hundred pounds of the mixture is sufficient for an acre varying according to the infestation and the spacing of the plants.

THE STRAWBERRY TORTRIX MOTH—*Oxygrapha Comariana*, Zell. —Petherbridge (6) found that the eggs are laid in November on the stipules of the plants. These eggs hatch in April or May, the young larvæ feeding at first on the young leaves, which are still folded in the centres of the plants, making holes through the successive layers. They are small, and remaining sheltered in the folded leaves are hardly to be observed until these unfold. Some of the larvæ then extend their activities and attack the unopened flowers, boring through the calyx and petals to feed on the stamens and carpels, causing either sterility or distortion of the fruit. These larvæ, like many other Tortrices, spin the leaflets or blossom trusses together with fine silken threads: this procedure affording a means of recognising an attack. Feeding may go on up to June, when pupation takes place amongst the webs and leaves. The moths, which emerge late in June and in July, may be found amongst the leaves of the plants, and fly only very short distances when disturbed. These adults lay eggs on the stipules at the base of the plant or on the leaf stalks. The resulting larvæ when fully fed, spin up in the leaves and pupate, giving rise to new adults, from September to November.

Control Measures.—Spraying with lead arsenate and dusting with powdered calcium arsenate and calcium arsenite was tried by Petherbridge, but gave unsatisfactory results. In discussing means of control he states: "The best means of reducing this pest seems to be to run a mowing machine over the crop so as to cut off the tops as close to the crown as possible, when the pest is in the second pupal stage, viz., at the beginning of September. . . . . The tops must be raked up and burnt." Furthermore, he advocates that when old beds are to be ploughed up, this should be done after the eggs are laid in November, since by being ploughed in they will be destroyed.

THE STRAWBERRY APHIS—*Siphonophora fragariella* (Theobald)—This aphis infests the strawberry from the early spring until the end of the picking season. The winter is passed in the egg stage, the eggs being located on the under sides of the leaves. In spring, during March or early April, the eggs hatch, giving rise to dark green sluggish, wingless, " stem-mothers " ; these produce numbers of living young; which later, in turn, generate winged forms. This species feeds by sucking the juices from the young leaves, the hearts of the crowns and the developing blossom trusses, causing a reduction in the size of the fruit. Slight attacks have been noticed at Long Ashton for some years, but little serious damage has resulted.

Control Measures.—Cutting off and burning the leaves in winter will destroy many eggs. Spraying is difficult, as the aphids frequent the densely foliaged parts getting right into the centres of the plants. Spraying with soft soap and nicotine, 2½lbs. soft soap and ¼ pint of nicotine per 50 gallons of soft water,* in early April, to destroy the newly hatched stem-mothers before they start reproducing, would probably give satisfactory results and is undoubtedly worth a trial.

OTHER PESTS OF THE STRAWBERRY.

MILLIPEDES. One species, *Blanjulus guttulatus*, Gerv., is often found attacking the fruit of the strawberry. It is pale yellow to brownish in colour, but may be darker, and has a row of purplish spots along each side ; it measures from 14—18 millimetres in length. As shown by Sorauer (9), this millipede haunts decaying vegetable matter and is found in most garden soils. The attack seems to be most prevalent after addition of farm yard manure, leaf mould, or other organic manures. It attacks strawberries by eating into the ripened fruits, these when broken open showing vast numbers of millipedes in the interior.

So far no definite control measures are known.

SLUGS.—The most important of these is undoubtedly the grey field slug, *Agriolimax agrestis*, L., for it feeds on practically all our field and garden crops, particularly the cultivated *Brassicas*, like cabbages, savoys, sprouts, etc., and lettuce and young peas and beans. In the case of the strawberry they eat the leaves, buds, blossoms and fruit, often doing very considerable damage.

*** If hard water has to be used, up to 5lbs. of soap may be necessary per 50 gallons.**

During showery weather, and when the plants are wet with dew, slugs find movement easy and, crawling about over the plants, feed quite openly; but in dry weather they remain hidden under straw, clods and leaves, and in the soil until evening, when they come out and feed.

The eggs are laid in clusters in the soil, frequently close to the base of the plants. They are at first elliptical, but towards hatching time they are practically spherical. Hatching takes place in three weeks to a month; the young slug, when fully extended, is from 3·5 to 4 millimetres in length, the colour is dirty white to cream, covered with very minute brownish spots, the eye tentacles are pinkish and can only be exserted for a short distance. These young slugs cannot easily attack sound vegetation, and in specimens hatched at Long Ashton they were observed to seek amongst the moist soil for fragments of decaying vegetation, neglecting grass blades and clover leaves where these were unbroken. When supplied with portions of cabbage leaves they fed at the broken edge for several days, not attacking the sound tissue until they were about a week old. As growth goes on the colour varies, though various shades of grey and brown, until finally a mottled grey-brown is assumed. Maturity is attained in from three to four months. Slugs are very long lived, often attaining the age of two years. Mating, as stated elsewhere (4), " takes place early in the morning, between 4 a.m. and 6 a.m., especially on wet or misty mornings, when the ground is very wet." The eggs are laid from a fortnight to three weeks later.

Control Measures.—Slugs are most difficult to control in that plantations, and gardens are always liable to infestation from adjoining land, and, moreover, very little can be done as regards poisoning them. Bordeaux mixture, copper sulphate, and many other poisons and contact irritants have been tested by American workers, but nothing very satisfactory has been advocated.

Soot, lime and salt have been used with varying success in this country, giving some relief when spread about between the rows and the plants. In a serious attack, a mixture of lime and salt, applied in the evenings, would probably be found useful. The mixture should be applied at hourly intervals, three dressings probably sufficing to destroy the offenders. A single dressing is of little use, since by exuding a quantity of slime the slugs are able to overcome the irritation.

Cleanliness is a very great factor, since slugs conceal themselves under all decaying vegetation, heaps of weeds, prunings, hedge-brushings, and so forth. Such refuse should always be collected after the various operations and burnt; the ashes having a manurial value, the usefulness of the materials manurially is not wholly lost.

GENERAL CONCLUSIONS.

Consideration of the foregoing pests shows that in a number of cases the winter is spent in some sheltered position, such as the rough herbage along hedge sides, ditch sides and on waste ground, therefore, where such herbage exists in the neighbourhood of strawberry beds, it should be kept down by periodic cutting or burning. Waste vegetable matter should never be allowed to lie about, but should be burnt, or composted in orderly fashion.

Attention to cultural operations and judicious modification of them is often very beneficial in reducing the liability to attack and promoting the general health of the plants. Moreover, grubs turned up in these operations should always be destroyed. Where a pest occurs in strawberry-growing areas, prompt action should be taken, since some pests will spread with great rapidity. Control measures should be adopted at once, and be carried out as thoroughly as possible.

REFERENCES.

1.—Curtis, J. (1860)—*Farm Insects.*
2.—Gibson, A. (1912)—*Bull.* 70 (Ent. Div.) Canadian Depart. Agric.
3.—Headlee, T. J. (1918)—*Bull.* 324, New Jersey Agric. Exp. St.
4.—Miles, H. W. (1921)—*Journ. Ministry of Agric.* (August).
5.—Ormerod, A. E. (1898)—*Handbook of Orchard and Bush Fruit Insects.*
6.—Petherbridge, F. R. (1920)—*Ann. App. Biol.*, Vol. vii, No. 1.
7.—Rennie, J. (1916)—*Ann. App. Biol.*, Vol. ii, No. 4.
8.—Roberts, A. W. R. (1921)—*Ann. App. Biol.*, Vol. viii, Nos. 3 and 4.
9.—Sorauer, P. (1913)—*Handbuch der Pflanzenkrankheiten.*
10.—Theobald, F. V. (1909)—*Insect Pests of Fruit.*

VI.—FARMING AND RECONSTRUCTION.

By Professor James Long.

It is impossible to ignore the fact that British agriculture is in an unsatisfactory condition. It has been failing the country for many years, but when, after the conclusion of the war, men of all ranks agreed that the time had arrived for its "Reconstruction," there appeared to be every hope that it would be placed upon a sound foundation. So far from this being the case, however—even allowing for the short lapse of time—the position is worse. The war taught us the vast importance of self preservation and the absolute necessity of avoiding for all time the perils through which we passed in those momentous years when we were threatened with shortness of food. In view of these lessons I submit that the word "Reconstruction" does not represent the necessities of the case. You cannot rebuild a system which has grown with our growth, and which is ingrained in the agricultural mind. The nation requires more home-grown food, and to this end it has a right to require every acre of land which is under a system of cropping, or which it is possible to crop after improvement or reclamation, to be thoroughly cultivated. That a very large proportion of the land under crop is only half cultivated or not cultivated at all, and that there is an enormous area of rough grazing land which ought to be brought under cultivation every man who has made a personal investigation of the subject is fully aware.

As one of the earliest advocates of security for the tenant farmer I fully realise the importance of legislation and of the value of Part II. of the Agriculture Act of 1920. In giving evidence before the Royal Commission, nearly thirty years ago, I advocated an advance in this direction and made some drastic suggestions which were ignored as impossible of adoption, but which have all now materialised. It is not, however, so much the legal as the practical side of farming to which we must look for the accomplishment of our desires. The stability of value will encourage the production of wheat and oats, and, indirectly, the breeding and feeding of stock, but this will not constitute reconstruction nor ensure that improvement in our practice which is essential, not merely to the welfare of agriculture, but to the safety of the State. You cannot convert a careless or indifferent farmer into an intensive farmer by Act of Parliament—not if he were provided with gratuitous seed and manure. He has an answer for every complaint of his practice, and that answer—justifiable at this moment—is the cost of labour. To a large extent farms are in wrong hands, a fact which we can no more avoid than we can prevent incompetent men opening shops and earning a precarious livelihood. I do not suppose that the percentage of those who fail to succeed as farmers is higher than the percentage of those who fail to make a success in the drapery trade, or as stationers, grocers, or tailors; nor do I believe that any system of education will enable these men to command success. We must look in another direction.

Before making any attempt to formulate a method of reconstruction it is our duty to seek where the faults lie. If it is in the system of farming that system must be altered, modified, or improved. If it is owing to the absence of that security which governs the expenditure of capital by the tenant on the land owned by somebody else—that security, if still insufficient, will have to be given. If again, it is due to the want of education, that education must be provided. Lastly, if, after all, it is due in the main to farmers themselves, to their lack of industry, capacity, or perseverance, or, indeed, to what I may term the "laisser faire" mode of their operations, then the failures must make room for better men. Farmers are stewards to the nation, and when so much is at stake, no steps should be avoided which will ensure their stewardship being efficient. A man is an unjust steward if he occupies land capable of feeding a thousand people and permits it by his bad management to feed only a hundred.

To deal first with the last point, with a knowledge of tenant farmers in all parts of this country extending to a period of over forty years, I am confident that there is a high percentage of men who are as capable, intellectually, morally and practically, as the finest type among the captains of other industries or the most able members of Parliament. Unhappily there is another type of tenant who predominates in number if not in character, and it is he who is responsible for the low averages of our crops, the inferiority of much of our live stock and its failing numbers, the condition of much of our arable land, and the non-cultivation of our pastures. Owing to causes which are governed by these two classes of men British farming is at once the best in the world and the most faulty. I have had exceptional opportunities of forming this opinion. There are numbers of farmers among us whose work is of the highest order, but the farms of the majority can neither compare advantageously with them, nor with the holding of the average German, who owns most of the land he farms, is more industrious, and whose production is larger.

With regard to our system of cultivation no reconstruction is needed. The object is to maintain the soil in clean, fertile, healthy and good mechanical condition. Roots and potatoes—if the work of cultivation corresponds with the requirements of the crops—enable the farmer to ensure all these qualifications, and with them good crops, throughout the rotation. The rotation system is sometimes condemned, but if it were abandoned in favour of cropping without a system every practical man would revert to it in some form, for he could not avoid it. Some farms are never clean; others, if passably clean, are never healthy, indeed, they cannot be without occasional deep ploughing and abundant weathering—submission to the summer sun and winter frost. They are either waterlogged in the rainy season, baked by summer heat, or invariably sour—all owing to imperfect, late, shallow, or halfhearted cultivation. Such soils cannot be fertile however abundantly they are manured. Fertility throughout a rotation depends almost as much upon the crops grown as upon the manure, and unfortunately, the crops of the usual rotations are either too restricted or too stereotyped. Steps are being taken to produce nitrogenous manures by extracting nitrogen from the atmosphere, and I remark in passing that, although as I believe Sir William Crookes was the first to make this a popular and practical question for subsequent solution—we were, as usual, the last in the field to commence their manufacture. Nevertheless, by the cultivation of leguminous plants suitable for green fodder, silage, and hay, the farmer can provide his own nitrogen as certainly as though he purchased so many tons of nitrate of lime. I venture to say that an inspection of a hundred farms taken at random all over England would fail to reveal five per cent. on which the crops included either lucerne, sainfoin, trefoil, or trifolium incarnatum, an incomprehensible omission even if every allowance is made for their suitability to the climate or the soil.

If we examine the subject of Education as a factor which is responsible for the condition of Agriculture, we are bound to acknowledge that the facilities afforded by our agricultural colleges have existed for a sufficient number of years to have made their influence felt. It is, however, seldom that we meet a tenant farmer who has passed through a course of scientific training. If the institutions are limited in number they apparently meet the demand, but the fees are so high that one cannot expect men of small means, who form the great majority of British tenants, to afford the expense which a full course of education involves. Subventions for educational purposes are not justified, where the advantages offered are conferred on men who are as well able to pay the costs for their sons as are those who are connected with other important industries. I have been both directly and indirectly connected with education in relation to agriculture for a long series of years and have specially examined the systems adopted in Canada, the United States, and numerous European countries. As a result I believe that we have pursued the wrong lines. Schools for the sons of small farmers, like those of Sweden, Norway, Denmark, France, Madison in Wisconsin, Geneva in New York State, and Guelph in Ontario, are essentially different, costing little, and in most cases providing a thorough course of instruction in the actual work of the farm and in the class room. Men who have passed through our agricultural colleges have frequently developed into politicians, officials and teachers, but I do not find among them the great breeders of stock. The ablest farmers known to the writer have, so far as he is aware, received no scientific education.

This fact is not mentioned in order to minimise the importance of classroom instruction, but to suggest that it is rather the man than the college which usually accounts for his successful career. In other words, scientific education must be put at the disposal of the right kind of farmer, instead of educating, as we do now, only those who can afford a big outlay of time and capital. While every occupier of land should possess the right to farm as he likes—conditionally upon his maintaining it in good condition—he has no right to farm badly, whether the land is his own or the property of somebody else. I cannot think that under any conditions this can be disputed. If this is the case it should form a text for discussion or a moral law upon which to base future action. I am acquainted with large areas of pasture land which, I believe, have been neglected for a generation, and which can only be compared with the condition of Essex at the time of the Royal Commission, 30 years ago. At that period I was driven some twenty miles through one part of that county almost every acre of which was abandoned on each side of the road. There were farmhouses partially ruined, derelict farms, villages almost uninhabited, gates and fences destroyed and land awaiting purchasers at £5 an acre. Impressions of the condition of agriculture in this district, once so prosperous, were given in a paper read by the writer to the Farmers' Club, but while a change for the better has been effected it was the work of the individual, chiefly the investor who bought up the farms. The land now awaiting cultivation, to which I have referred, is gravitating towards a similar catastrophe, and as there is much that is almost equally bad in other parts of the country, the question arises as to how its improvement should be effected. Although there is no immediate prospect of an inadequate food supply it is obvious that with our large population every acre capable of producing a crop of some kind should be under cultivation. This view was apparently the view of the Government, but with the versatility it has developed in relation to agriculture, and owing to the fact that farmers distrust it, as they might reasonably have distrusted some of its predecessors who performed few of their promises, the Ministry now hold the opinion that the salvation of agriculture depends upon farmers themselves. The fact that farmers are organized in every county in England, as I persisted in suggesting they should be in the Central Chamber before the Farmers' Union was started, is a sufficient guarantee that the huge nucleus thus formed can by a campaign of propaganda haul into the net the vast majority of the tenantry of the country. If this occurred there is nothing to prevent the farmers themselves from following the same line of action which was adopted by the County Committees during the war, so far as the law will permit them. Three are no more severe judges than a body of competent farmers when it comes to examine the work of a careless, indifferent, or incompetent member of their order. Let the County Committees of the Union take up this work of reform, and I venture to say they will do it with great advantage to the nation. While the Government plan, as detailed in the moribund Act, was impossible in practice and calculated to cause continuous and widespread litigation, the verdict of the Union in the bad cases the Act anticipated would by ostracising the culprit prove much more effective. I believe that farmers are not only just men, but that they possess the material which is as capable of great performances as any other body of men in the country.

What are the " laws of good husbandry " is a question which may fairly be asked. As regards pasture, such land should be drained if necessary, harrowed, rolled, stone-picked, kept free from thistles, and adequately manured. Arable land should be properly managed—manured and maintained in a clean and healthy condition. Where a farmer displays his incompetence in the management of his cultivations he has missed his vocation and should make room for a more competent man. Apart from mechanical cultivation, which exercises such a marked influence upon the soil, and almost controls its healthy condition, especially where it is handled at the right time, I regard health and fertility as much the most important features of good husbandry. Neither a wet soil nor a sour soil can be healthy and productive. Both draining and liming are potential factors in the production of healthy crops and the maintenance of healthy stock. Fertility, which may be materially assisted by judicious cropping, is mainly but not altogether, a question of manure,—and especially of fertilisers,—for practically no farmer produces sufficient dung to keep his farm in a high state of fertility. The secretion of nitrogen by the clovers and allied plants depends chiefly upon the provision of phosphates, and as from this point of view as from others, phosphates are the basis of successful cropping, the question arises as to whether something cannot be done to provide a larger quantity of phosphatic fertilisers at a lower price. *The pastures of England are suffering from phosphate starvation, and partially through want of phosphates, from nitrogenous starvation.*

Sometime ago I had the advantage of walking over Down and other farms in Surrey, Sussex, Wilts, Dorset and Warwickshire and of witnessing the astounding transformations in the herbage caused by the liberal use of basic slag. This manure not only improved the graminiverous herbage and depressed the weeds, but produced abundant clover, where clover had scarcely been previously recognised, with the result that nitrogen secretion commenced. If this is possible on the Down lands of Sussex and Dorset, it should be possible on other rough grazings of which we possess so large an area. Before the war, when phosphates were cheap and when quantities were exported because British farmers were less willing to buy them than the farmers of the Continent, our consumption was much smaller per acre than that of any advanced continental country. Since prices have risen it is probably smaller still, but it is practically certain, however large the quantity of nitrogenous fertilisers placed at our disposal, that there can be no advance in the yield of our crops until phosphates are used with much greater liberality. Parsimony in this direction is equivalent to withholding proteids from the cow—by feeding her upon turnips and straw and expecting her to milk at her best.

There is a natural limit to the supply of basic slag for its production depends upon the extent of our steel manufactures. There is also a limit to the supply of bones and coprolites, but it is questionable whether there is a tangible limit to the supply of phosphatic rock. If, then the home supply of phosphates is inadequate, it is possible for the Government to make ample provision by importing the raw material, and I regard its assistance in this matter as of greater importance than its technical advice, and for this reason. Phosphatic manures are absolutely essential to an increase in our crops, whereas technical advice is thrown away upon the capable farmer who is in a better position to give it than a non-practical man, while it is also thrown away on the incapable farmer who declines to read or to act upon it. It is highly important that there should be an abundant supply of basic phosphates, and if slag is insufficient basic superphosphates might be provided—in each case at the lowest possible cost. The lower the cost the larger the quantity farmers who appreciate the value of this class of fertiliser will use, or be induced to use, but no efforts in this direction will induce the indifferent to use it until he is convinced by neighbouring demonstration.

Our agriculture has not kept abreast of our growth. Our consumption of imported farm produce has grown larger and larger as our consumption of home produce per unit of the population has grown smaller. Farms in some counties have grown bigger, while the small holding system, to which so much attention has been given, has so far failed to progress. In some counties, and I find an example in Surrey, the mistakes in initiating small holdings were so incomprehensibly great that one might have supposed the responsible committee was composed of persons possessing no knowledge whatever of land or its cultivation. We have for many years encouraged the provision dealer with his hundreds of shops, and owing to his energy there is an increasing consumption of oversea produce, but we have simultaneously discouraged one of the most important sources of food production by abandoning the open market in which the small farmer sells direct to the consumer. The men who should provide not only themselves but their neighbouring townsmen with poultry and eggs, butter and cheese, fruit and vegetables, rabbits and pork, are among the principal buyers of these foods in the towns they ought to supply. Across the channel similar shops are almost unknown. The whole trend of the trade in food products is in the direction of other countries, but although we all know it we still continue to leave the question in the hands of a Government which has abandoned the attempt to deal with it. I regard the open market system as I know it in the splendid displays from Boulogne, throughout France, to Zurich and Berne, as incomparably superior to the system which has been so constantly preached of late years—I refer to co-operation among small producers for the sale of their goods. This system involves expense in collection, packing and conveyance to salesmen or a depot in town, handling at its arrival and re-despatch to country and other retailers. It leaves the farmers without any control over prices or profits, and involves him in various charges. His goods, too, find their way to retailers, whereas they ought to be and could be sold direct to the public. Practical connection with this subject, experience on the Small Holdings Committee, and personal contact with small holders and their colonies in various parts of the country compel me to urge my belief that they would prefer to market their own produce and would gladly do so in the towns if the opportunity were afforded them.

Wheat is not the only crop to which the Government should pay attention. We need a multitude of small cow keepers, pig breeders, and poultry keepers. At the moment of writing our market is largely supplied with foreign-grown fruit. Our eggs and poultry are largely imported. Milk realizes a price which six years ago we should have regarded as approaching famine. British butter is possible only on the tables of the rich, while imported butter is still too costly for the great majority of the public. Bacon, which can be produced with considerable profit, is chiefly imported, while it is ridiculously dear and inferior in quality. The agricultural classes, to whom we have a right to look for these commodities, are themselves among the most frequent buyers, preferring to eat imported foods rather than to take the trouble to grow it. Meanwhile young and willing ex-service men with no occupation are waiting for land or the instructions which will enable them to till it. I have received numerous applications from such men seeking advice, and as I write a pitiful letter reaches me from a bank clerk of 27, an ex-officer, who was wounded in the war, and advised to seek a career in the open air. He has received practical instruction on a farm to which he was sent, but sees no chance whatever of obtaining a small holding. Such is the too common complaint.

This leads to one phase of the question of land reclamation. So far as the public is able to learn, since reconstruction and home production on an adequate scale were proposed towards the end of the war, there does not appear to have been any serious attempt made to rescue waste land and bring it under cultivation. The country needs this land—men are waiting for it, and it has a right to complain if it is not forthcoming. If the Government is unable to provide the money required by the Development Commissioners it would be far better to select men who are competent to deal with it and to hand it over to them on condition that they reclaim it, and subsequently cultivate it in a satisfactory way. If a man brings twenty acres of waste land into good cropping condition he will not be overpaid for his labour if he receives it as a free gift. It will at least become a national asset, which at this moment it is not. Should such a course be considered advisable it would be a much wiser plan to leave it in the hands of the County Agricultural Committee, when they are composed of landowners and farmers than to the less practical officials of a Government department.

The landowner is expected under post-war conditions to play a more intensive part in the management of his land. While I am one of the last to find fault with the owner of land, I think that in the interests of the country it is time that he developed into a captain of industry, leading, guiding, and advising his tenants in their particular roles. It is perhaps of more importance that the landowner should receive a more complete education on the Practice and Science of Agriculture than the tenant who farms it. Indeed, with greater opportunities at his command and a tangible stake in the country, he should not only possess a wide knowledge of his subject, but be in a position to assist and encourage his tenants and to act as their friend. This, however, can only be possible where there is no class distinction beyond that which knowledge confers, for while educated men will continue to seek the society of educated men they have usually the grace and tact to avoid those social distinctions which set class against class.

Although this article is not intended to embrace the numerous technical questions which surround the whole subject of agricultural development I briefly refer to some of the most important. The country is anxious not merely to recover from the very serious reductions in its live stock but to keep pace with the advance in the population. It will, however, be impossible to maintain the requisite increase in our arable crops unless there is sufficient land to pasture more stock than ever the country has owned, and unless the most is made of it. I especially point to the rough grazing to which I have already referred. In addition to this source of food it is now more fully realized that arable forage crops supplied in the stall will feed many more cattle than pasture land. An increase in our cattle may be expedited by a ban on the slaughter of calves and by the importation of Holsteins, which have already proved a source of considerable benefit to many farmers; while the improvement of stock of all kinds may be effected by the employment of suitable males on the plan which has been already commenced under the Development Commissioners. So far as the pig industry is concerned its condition is a disgrace. No stock can be so quickly increased in number, while with none is so little attempted, apart from a few breeders of pedigree stock. Farmers cannot be compelled to feed pigs, but if the matter is brought plainly before them and efforts persistently made to place the industry in a position of security, it ought to succeed as well as it has succeeded in Denmark. Last of all comes the production of poultry, to which so many large farmers pay little attention. I am, however, acquainted with two large farmers, men of position and culture, who tell me that they make £500 a year of their eggs. This fact shall speak for itself, for it is more to the point than a volume.

A last word about labour. One has only to cross the Channel to the best farming districts of Normandy to find every effort being made to increase production. Here the labourers work late on the land—ploughmen for instance being out with their teams until six in the evening. Agricultural labour does not, and cannot conform to the same rules and conditions which apply to labour in industrial areas.

We live upon an island of limited area, which is provided with a fertile soil and a mild climate. We possess greater advantage than any other country in Europe with a wonderful market at our doors. We have skilled farmers with capital, and we own the best stock in the world. If we cannot make agriculture a thorough success under these conditions we have no one to blame but ourselves.

VII.—THE IMPROVEMENT OF POOR PASTURES.

WITH ESPECIAL REFERENCE TO THE ERADICATION OF BRACKEN AND THORN.

At a Meeting of the Society's Council held on July 27th, 1920, Mr. H. B. Napier proposed that an active policy be resumed in the Educational work for which the Society had been noted before the War, and that the improvement of poor pasture land provided an excellent opportunity for the resumption of this work. This motion was agreed to; the Experiments and Education Committee, to whom the matter was referred, reported favourably upon it, and work was started during the summer of 1921.

The main idea underlying the work of the Committee is to demonstrate as widely as possible to owners and occupiers of rough hill pastures, that they can, by the eradication of bracken and thorn, and by suitable manurial treatment, carry a greatly increased head of stock on such land, without incurring greater expense than will be more than counter balanced by increased returns. It may be assumed that the West of England and indeed some of the Southern districts will never be areas that will easily lend themselves to a policy of increasing the acreage under the plough. Therefore to improve the yield of pasture land is the best means of adding to the supply of home grown food from these districts.

In order that the demonstration plots should be accessible to as many farmers as possible, and should include a sufficient variety of soils to make the results generally applicable, it was resolved to try to obtain plots in Gloucestershire, Somerset, Devon, Dorset and Hampshire. Various difficulties have, however, prevented a complete start being made on more than four out of the five plots. In the case of one of the selected sites analysis of the soil showed that different geological formations were responsible for the surface soil, so that it would have been impossible to make clear-cut deductions from the results obtained. Difficulties have also been experienced in finding plots which were efficiently fenced in. Enough has been done, however, on four of the plots to justify the publication of the preliminary reports which appear below.

Previous experiments have been carried out on the eradication of bracken in Scotland and in North Wales, and the results obtained in these investigations indicated that the most economical method of eradicating bracken from poor pastures is by the systematic cutting of the bracken at definite times of the year, over a period of two or three years. The time of the first cutting of the season appeared to be important, and it was found that the optimum time for this operation in the districts concerned was during the beginning of July. It was decided, therefore, that in the present experiments the relative effectiveness of cutting the bracken for the first time in the first week in June and in the first week in July on the various plots should be ascertained, as the optimum time might vary for the different districts. Following on this idea, each of the experimental plots have been divided into two sub-plots—one being designated the June plot and the other the July plot.

With reference to the proposed scheme of manurial treatments, as phosphatic manures—especially basic slag—have been found to be of great value in renovating poor pastures, and as deficiency of the soils of the plots in phosphates was indicated from the soil analyses, it was decided in the first instance to treat portions of the June and July plots at the various centres with dressings of a high grade basic slag, and to compare these manured areas with the unmanured ones.

This manurial programme, as first decided upon, has been slightly extended, and areas at certain of the centres are to be treated with dressings of Nauru phosphate and lime respectively. The reasons for extending the manurial treatments to include these two manures are as follows :—

Nauru phosphate is a ground mineral phosphate containing about 85 per cent. of total phosphates, *i.e.*, it contains a percentage of total phosphates twice as high as the highest grade pre-war Bessemer basic slag. The efficiency of this material as a source of supplying phosphates to pastures has not so far been tested, but other ground mineral phosphates of a similar character to Nauru phosphate have been found to give results which compare favourably with basic slag on certain types of soil in certain districts, and hence it seems reasonable to expect that Nauru phosphate will prove an efficient manure under conditions similar to those in which other mineral phosphates have given good results. Should this fertiliser produce good results on the herbage of poor hill pastures, in virtue of its extremely high content of phosphates, it will be especially useful in developing this class of land, as one of the greatest problems in any such scheme of renovation is that of overcoming the tremendous amount of labour involved in applying the necessary amounts of fertilisers to effect the desired improvement.

It was decided to test the effectiveness of applying dressings of lime as a means of aiding in the eradication of bracken from and of improving the herbage of bracken-covered areas, in view of the results obtained in the preliminary examination of the soils from areas of the experimental plots on which bracken was growing, and from adjoining areas free from bracken. These results indicated that land which is covered with bracken tends to become sour more rapidly than the same land bearing normal pasture plants.

Valuations of the plots were made before operations were commenced, and are to be repeated each year so long as the demonstrations are in progress. Records will be kept of the cost of the labour and manures employed, and of the number and description of stock fed on the land. Attention will also be given to the mechanical treatment of the plots, as it is thought that this may have an important bearing on the improvement of the herbage. The Agricultural and Horticultural Research Station at Long Ashton, has very kindly undertaken the preparation of full chemical and botanical analyses of the plots. The Committee also decided to test the value of pure Nauru phosphates in this connection.

The plots are arranged in sections so as to enable comparisons to be made between manured and unmanured ground, and between ground where the bracken has been cut at different periods of the year. Below will be found detailed reports of the analysts and Stewards in charge of the plots.

SOILS OF THE DEMONSTRATION PLOTS.

(By Capt. T. Wallace, M.C.)

The soils of all the experimental plots have been sampled and analysed during the summer of 1921. The tabulated results of the analyses—mechanical and chemical—are appended.

General Discussion of the Soils.

The soils of the four plots are derived from at least three different Geological Formations, viz.: Carboniferous Limestone, Millstone Grit, and Lower Lias, whilst it is probable that on the Lydney plot there are outcrops of The Coal Measures and Old Red Sandstone. Indeed the " stones " present on this latter plot on the July portion appear to belong to The Coal Measures series, whilst the mechanical analyses of the samples from the various parts of the plot are typical of the Old Red Sandstone series.

An examination of the analytical results brings out the following points:

The percentages of organic matter present in the surface soil samples are quite normal for pasture soils for the various types of soil represented, none of the soils being of a peaty nature.

The amounts of phosphoric acid, both " total " and " available " in the soils are generally low, especially in the Long Ashton Golf Course soil and in the Wootton Fitzpaine soil.

None of the four soils contain any calcium carbonate and all have high " lime requirements," *i.e.*, they are extremely acid.

A very interesting point has been brought out in studying the acidities of the various portions of plots, viz.: that on any plot if the acidity of the soil of a bracken covered area is compared with the acidity of a non-bracken area, the acidity of the former is higher than the acidity of the latter. This point has been studied in greater detail on the Long Ashton Golf Course Plot, and the results are discussed more fully below.

The results appear to show that the growth of bracken over an area tends to make the soil acid more quickly than does the growth of the ordinary grasses and other plants present in pastures.

Manures Recommended.

As is generally the case with poor hill pastures showing high lime requirements and low phosphoric acid contents, it is probable that the most effective and most economical manure to use will be a high grade basic slag.

An application of this material to the portions of the plots to be manured at a rate to supply 150 lbs. per acre of phosphoric acid (P_20_5) is recommended.

The soils of the various plots are discussed below.

Long Ashton Golf Course Plot.—Soil samples taken May, 1921.

The soil of this plot is derived from the Carboniferous Limestone series. It overlies a mass of Mountain Limestone, which in places on the plot comes to the surface. The soil varies in depth over the plot, in some places being only about 4 inches deep, while at other points it appears to be several feet in depth. The surface soil is a heavy loam, and where the subsoil exists it is of a very " clayey " nature.

The phosphoric acid content of this soil is low and it is expected to respond in a marked fashion to dressings of basic slag.

As the bracken on this plot was growing on several well defined areas, and as the bracken on these areas obviously differed in age, it was decided to compare the lime requirements—*i.e.*, acidities—of the surface soils on these various areas and to further compare these with the lime requirement of an area of the plot on which no bracken was growing.

The samples taken for this purpose are denoted as A. B. C. D. in the table of results. The particulars of the samples are as follows:—10 cwts. of 30% slag per acre, will supply 154 lbs. of phosphoric acid (P_2O_5) per acre.

Sample A.—Taken from a bracken area where the bracken was making vigorous growth, and was evidently well established.

Sample B.—Taken from a bracken area where the bracken was obviously just establishing itself.

Sample C.—Taken from a bracken area, which was older than *A*. Here the bracken had evidently been established for some considerable time, the surface soil containing innumerable old decayed bracken roots, whilst the growing shoots appeared to have lost much of their former vigour.

Sample D.—Taken from a non-bracken area.

It will be seen from the results given in the table, that the order of the samples arranged in order of descending lime requirements, is as follows:—C. A. B. D.—this being also the order of descending ages of the bracken areas. Thus the sample from the oldest bracken area is the most acid, whilst the sample from the non-bracken area is the least acid of the bracken areas, the acidity of this latter sample being in turn higher than the acidity of the sample from the non-bracken area.

Wootton Fitzpaine.—Soil samples taken July, 1921.

The soil of this plot is a deep heavy loam belonging to the Lower Lias Formation.

It has a low phosphoric acid content and is strongly acid in re-action. It is expected to respond very markedly to dressings of basic slag.

The acidities of the surface soil samples from the bracken and non-bracken areas may be compared in the table of analyses.

LONG ASHTON GOLF COURSE—(Carboniferous Limestone).

	Sample A.	Sample B.	Sample C.	Sample D.	Sample X †
	%	%	%	%	%
Mechanical Analysis.					
Stones in Sample	Nil	Nil	Nil	1·0	Nil
Fine Gravel		1·60			2·08
Coarse Sand		4·45			4·83
Fine Sand..		27·61			25·92
Silt		14·60			12·78
Fine Silt		18·00			16·74
Clay		19·72			28·11
Chemical Analysis.					
Moisture	3·03	3·68	2·98	5·24	2·76
Loss on Ignition (Organic matter)	11·90	8·78	9·44	17·22	5·12
Total Potash (K_2O)	0·872	0·882	0·642	0·912	1·101
*Available Potash (K_2O) ..	0·0122	0·0076	0·0117	0·0170	0·0192
Total Phosphoric Acid (P_2O_5) ..	0·125	0·088	0·084	0·189	0·062
*Available Phosphoric Acid (P_2O_5)	0·0048	0·0055	0·0033	0·0169	0·0029
Calcium Carbonate	Nil	Nil	Nil	Nil	Nil
Lime Requirement	0·601	0·562	0·640	0·523	0·233

* Soluble in 1 per cent. Citric Acid. † Sub-soil Sample.

WOOTTON FITZPAINE—(Lower Lias).

	Bracken Area. Surface Soil.	Bracken Area. Sub-Soil.	No Bracken Area. Surface Soil.
	%	%	%
Mechanical Analysis.			
Stones in Sample	Nil	Nil	Nil
Fine Gravel	0·31	0·32	
Coarse Sand	0·71	0·80	
Fine Sand	21·02	24·88	
Silt	23·85	21·68	
Fine Silt	24·65	22·74	
Clay	13·86	20·41	
Chemical Analysis.			
Moisture..	3·42	2·27	3·26
Loss on Ignition (Organic matter) ..	10·66	6·08	10·18
Total Potash (K_2O)	0·708	0·758	0·656
*Available Potash (K_2O)	0·0299	0·0139	0·0279
Total Phosphoric Acid (P_2O_5).. ..	0·133	0·0916	0·137
*Available Phosphoric Acid (P_2O_5) ..	0·0096	0·0073	0·0091
Calcium Carbonate	Nil	Nil	Nil
Lime Requirement	0·678	0·504	0·640

* Soluble on 1 per cent. Citric Acid.

LYDNEY.

(Probably Coal Measures, Millstone Grit and Old Red Sandstone Outcrops on this Plot).

	June Plot Surface Soil.	July Plot Surface Soil.	No Bracken Area. Surface Soil.
	%	%	%
MECHANICAL ANALYSIS.			
Stones in Sample	17·8	9·00	2·00
Fine Gravel	3·20	3·02	0·74
Coarse Sand	20·16	23·33	24·06
Fine Sand	25·53	29·48	30·57
Silt	11·94	13·45	11·27
Fine Silt	19·01	14·62	16·12
Clay	8·60	5·81	6·82
CHEMICAL ANALYSIS.			
Moisture..	2·17	1.96	1·96
Loss on Ignition (Organic matter) ..	8·50	7·22	7·70
Total Potash (K_2O)	0·564	0·459	0·635
*Available Potash (K_2O)	0·0288	0·0218	0·0174
Total Phosphoric Acid (P_2O_5).. ..	0·112	0·116	0·107
*Available Phosphoric Acid (P_2O_5) ..	0·0150	0·0151	0·0133
Calcium Carbonate	Nil	Nil	Nil
Lime Requirement	1·143	1·043	0·963

* Soluble in 1 per cent. Citric Acid.

ASHTON PARK (MILLSTONE GRIT).

	Bracken Area. Surface Soil.	Bracken Area. Sub-Soil.
	%	%
MECHANICAL ANALYSIS.		
Stones in Sample	13·8	19·0
Fine Gravel	4·09	8·66
Coarse Sand	8·97	9·82
Fine Sand	30·92	26·22
Silt	15·89	11·41
Fine Silt	16·89	14·81
Clay	10·49	20·81
CHEMICAL ANALYSIS.		
Moisture..	4·57	3·93
Loss on Ignition (Organic matter)	7·04	3·60
Total Potash (K_2O)	0·717	1·123
*Available Potash (K_2O)	0·0057	0·0283
Total Phosphoric Acid (P_2O_5)..	0·123	0·0931
*Available Phosphoric Acid (P_2O_5)	0·0108	0·0140
Calcium Carbonate	Nil	Nil
Lime Requirement	0·400	0·220

* Soluble in 1 per cent. Citric Acid.

Lydney.—Soil samples taken July, 1921.

It is probable that most of the soil of this plot belongs to the Old Red Sandstone Formation, and if there are not definite outcrops of the Millstone Grit and of The Coal Measures Formations, on the July and June plots, as indicated on the Geological map of the area, there are present pieces of Sandstone, which at least are suggestive of the latter formation.

The amount of phosphoric acid in the available form appears to be higher in this soil than in the Long Ashton and Wootton soils. The most striking point about the soil of this plot is its exceedingly high " lime requirement."

The appearance of the bracken on this plot suggests that the bracken has spread from the June plot to the July plot, in which case the former will have been covered with bracken longer than the latter. In this connection, it should be noted that the acidity of the soil from the June plot is higher than that from the July plot; also that the acidity of the soil from the July plot is higher than that of the soil from the non-bracken area.

Ashton Park Plot.—Soil samples taken October, 1921.

The soil of this plot is derived from the Millstone Grit Formation. The surface soil is a heavy loam and overlies a stiff clay subsoil. The amount of phosphoric acid in the soil is again on the low side. The " lime requirement " of this soil is much less than of the soils of the other plots.

At this centre it was not possible to obtain a sample from a non-bracken area for comparison of acidities of bracken and non-bracken areas.

BOTANICAL ANALYSES OF THE PLOTS.

(Report of progress in the preliminary observations carried out by
O. V. Darbishire and C. Hunter, Department of Botany, University of Bristol.)

We wish to state at once that this report of progress during 1921, is purposely made very brief, because so far very little beyond a preliminary survey of the problem has been possible :—

1. Long Ashton Golf Course Plot.

On July 19th, we examined two small areas measuring each 2 by 2 yards, and examined them carefully in order to get some measure of the density of growth and size of the bracken fronds.

The first area selected had been cut on June 21st of this year, and was accidentally fired on June 23rd. It carried altogether 57 fronds and these varied in height from 1 inch to 24 inches. The other small area was also cut on June 21st, but was not fired. It carried 38 fronds, measuring about 24 inches on the average. A further cutting of these areas was carried out on August 16th and on October 20th, some bracken fronds had grown up here to a height of 6ins. They were largely uncoiled and therefore represented dwarf fronds.

On the same date an area of 2 by 2 yards was examined in the July plot that had so far not been cut. It carried 89 fronds, measuring on the average 3ft. 6ins. in height. The bracken in this portion of the plot was cut on July 20th, and this cutting proved fatal as far as the current season is concerned. No further growth was observed by October 20th.

These preliminary observations seem to show that the underground rootstock of the bracken will send up and feed a frond till it is mature and full grown. Once this has been achieved cutting will not stimulate the rootstock to form a second frond. But till a mature frond has been produced the rootstock will as long as the reserves permit send up fronds after each cutting. Maturity is reached when spores are formed.

It should be mentioned that the Fennwood, to the south of the Golf Course Plot, contains practically no bracken plants. Just inside the boundary wall dogs' mercury is rampant, and in places where an overhanging tree casts a shadow on to the neighbouring portion of the Golf Course area, may through a gap in the wall invade the experimental plot. On the other hand where we get a gap in the wall leading to a lighter part in the wood, we may get bracken plants in small numbers invading the wood. The source of infection by bracken of the golf course plot does not therefore seem to be the wood. The bracken here at any rate distinctly avoids the darker forest.

2. ASHTON COURT PLOT.

Observations were made on the June plot on July 19th. It was cut for litter in 1919, but as late as September. This cutting therefore will not have had any effect on the growth of the bracken. In 1920 it was cut in June, and in 1921 in May. An area of 2 by 2 yards was found to carry 55 fronds, with an average height of 1 foot.

In the neighbouring spinney the same area as regards size and at the same date yielded 122 fronds of an average height of 3 feet.

This portion had been cut in previous years for litter, but apparently too late for the cutting to have any effect on the growth of the bracken.

3. WOOTTON FITZPAINE PLOT.

Observations at this plot were made on July 14th, 1921.

Two areas measuring 2 by 2 yards were first examined, both of which had not been cut in 1920, nor in 1921. One of these carried 122 fronds measuring 4ft.-5ft. in height, for the other the figures were 144 and 4ft.-5ft.

Two other areas of the same size were examined on the same day. These had been cut regularly for stable bedding, but not in 1921. They showed 178 and 205 fronds, the latter measuring 2ft. 6in. and 2ft. 10in. respectively.

Cutting here has had the effect of encouraging the growth of more fronds in the subsequent season, but these fronds were below the average in height.

4. LYDNEY PARK PLOT.

Observations were carried out at the Lydney Park Plot on July 7th, 1921.

The first area examined was in the "unmanured June plot," which had been cut on June 6th of this year. A line was drawn across the plot and every fourth foot was made the base of a small square measuring 1ft. by 1ft. The presence or absence of dead, crippled or fresh fronds only, in the resulting 22 small squares was noted. This method gives the proportional frequency of the three types for the whole plot. We found the frequency to be in the proportion of 10 fronds destroyed by the June cutting, three crippled but retaining at least the lowest two branches of the main axis of the frond, and 20 full grown fronds. The proportion therefore was 10 dead fronds to 23 living, or practically 1 : 2.

An area of 2 by 2 yards close by and in the same condition was then examined by counting the fronds. It yielded 59 destroyed fronds, 26 crippled and 93 complete fronds. This proportion works out as 59 dead to 119 living fronds, or again practically as 1 : 2.

The fronds in these two areas reached a height of about 30ins., the crippled fronds being about 20ins. high when bearing only two branches to the main axis, or 30ins. when having four branches.

An uncut and unmanured area, measuring 2 by 2 yards, close by, yielded 130 fronds, which compares well with the 119 in the immediately preceding observation.

These observations show that here the rootstocks endeavour to send up about the same number of fronds, but that after a cutting early in the year the second fronds are smaller, lighter in their green colour, and of less stout build. By their growth last years reserves of food are being still further depleted. The plant is endeavouring to make good this depletion by unfolding a second leaf. But there is little likelihood of this being accomplished.

5. GENERAL REMARKS.

It is not possible at this stage to draw any very accurate general conclusions as to the significance of the observations made so far in connection with the Bracken Eradication Experiments. The season of 1921 was an exceptional one, and the dates on which cuttings were made gave certain results. Experience alone, however, can show whether the same dates will yield the same results in another more normal year.

The acidity tests so far show that the older the bracken plot the higher the acidity. The bracken is a slow peat forming plant, it prefers acid soil and will make the latter still more acid. We would like to mention in this connection that experiments are being carried out in the Botany Department of the University of Bristol, and will be continued throughout the winter and spring, in order to observe the various conditions which affect the germination of the bracken spores. These experiments will be carried out mainly with a view to testing the effect of varying degrees of acidity and alkalinity of the soil on the rate of germination of the spores. The results should give us an important insight into the habits of the plant which we have set out to exterminate.

Progress Report for 1921.

BRACKEN ERADICATION.

The weather during the season has been abnormally dry, scarcely any rain having fallen during the period April to late August. The ground of the plots during the summer has been very hard and it was evident that the drought delayed the growth of the bracken during the early part of the season.

LONG ASHTON GOLF COURSE PLOT.

This plot is situated on Ashton Hill at an altitude between 300 to 400 feet above sea level, and adjoins the Long Ashton Golf Course near its western end, from which it has been fenced off with creosoted posts and six strands of galvanized wire, in order to carry out the experiment. The cost of this fence 406 yards long, with one gate and posts amounted to £40 15s., and has been borne by the estate.

It covers an area of approximately 15 acres, most of which is on the slope of the hill, which is fairly steep, whilst a small proportion of the plot is on the summit of the hill and is practically devoid of gradient.

The plot is roughly rectangular in shape and previous to the experiment it was fenced in on three sides, so that it has only been necessary to fence the remaining side in order to enclose the piece.

For some years previous to 1921, this plot had been grazed with sheep and the bracken had been left untouched. The latter at the beginning of the experiment covered about 13 acres and for the most part appeared to be making strong healthy growth and to be well established.

There were also numerous bushes on the plot and clumps of thorns were scattered over its area. The herbage on the bracken covered areas consisted chiefly of very coarse grasses, useless to stock, whilst on the patches free from bracken some trefoil and a little clover was visible.

The soil over the greater part of the plot is very thin and in many places the limestone rock which it overlies can be seen.

The grazing value previous to treatment was valued at 10s. per acre per annum.

For the purpose of the experiment, the plot has been divided into two portions, each approximately 7½ acres in area, the dividing line running down the slope from north to south. The plot to the east of this line has been used for the June cutting treatment—June Plot—and the west plot for the July cutting treatment—July Plot.

STOCKING OF PLOT.

As there was no "feed" on the plot during this season until the middle of August no stock were grazed on it before that date. Since then 25 cows and six horses have had access to the plot from an adjoining pasture for five weeks during which period they spent a considerable amount of their time on the plot. Sixty sheep have been grazed since the removal of the cows and horses up to the present time and the herbage has been considerably eaten down.

JUNE PLOT.

It was found impossible to have the first cutting done during the first week in June as laid down in the original scheme of experiment, this cutting being commenced on June 21st, but it is probable that the condition of the bracken at the time of cutting was more nearly what it would have been at the beginning of June in a normal season.

At the time of this cutting, the bracken was on an average about 3 feet high, and many of the fronds appeared to be fully grown.

During the cutting. some of the cut bracken at the east end of the plot was accidently " fired " and owing to the excessively dry state of the herbage and cut material, the fire spread practically over the whole of the June plot, burning all the cut bracken and the rough grass over this area and also over about one acre of the July plot. The bracken of this portion of the July plot was practically all killed by the fire and although the area was included in the first July cutting, as the damaged plants remained standing, since then the bracken has developed so much on the lines of the bracken on the June plot, that this area from the time of the first July cutting has been transferred to the June plot.

The June plot was cut over a second time on August 16th, by which time the bracken was again thickly grown over the plot, the plants having made a strong healthy growth averaging from 1 to 2 feet in height, and appearing to be fully developed.

By September 20th, numerous plants of bracken had attained a height averaging from 6in. to 9ins. in height, but the number of plants was much less than previous to the August cutting.

These plants have been allowed to mature and on visiting the plot on October 20th, it was noted that most of the plants were ripening off, and that they did not appear to have grown much since September 20th.

A table giving details of cuttings, costs, etc., for both plots is appended.

JULY PLOT.

The bracken on this plot has only been cut once during the season commencing on July 20th. The plants at the time of cutting averaged about 3ft. 6ins. in height, were fully grown and indeed some of them appeared to have begun to ripen and could be broken off from the roots very easily.

Since this cutting up to October 20th the bracken on this plot has made no visible growth and the plot looks quite free from it.

DETAILS OF WORK CARRIED OUT ON GOLF COURSE PLOT.

Plot Cutting.	*Bracken Cutting.* *Details of Operation.*	*Acreage (Approx)*	*Cost.* £	*s.*	*d.*
June 1.	Handcutting bracken with scythes. Three men for five days @ 8s. per day per man	3	6	0	0
	Cutting bracken with mowing machine. One man, two horses for one day	3½	1	10	0
June 2.	Handcutting bracken with hooks—over 8½ acres. Three men for one day @ 8s. per day per man	8½	1	4	0
	Total cost of cutting bracken on June Plot		8	14	0
July 1.	Handcutting bracken. Four days @ 8s. per man per day	4½	6	8	0
	Cutting bracken with mowing machine. One man, two horses part of one day	2	1	0	0
Total cost of cutting bracken on July Plot			7	8	0

CLEARING BUSHES AND THORNS.

		£	s.	d.
June & July	Grubbing bushes. One man for six days @ 8s. per day	2	8	0
	Cutting thorns. One man for two days @ 8s. per day	0	16	0
	Hauling and burning bushes and thorns. Three men for two days @ 8s. per day ..	2	8	0
	Total cost of clearing bushes and thorns ..	5	12	0
	Total cost of work done on Plots ..	21	14	0

ASHTON PARK PLOT.

This plot is situated on the portion of Ashton Hill enclosed in Ashton Park at an altitude of 300 to 400 feet above sea level, and is less than half a mile from the Court.

The plot covers an area of five acres and forms part of a 60 acre field, which previous to 1918, was part of the Deer Park.

Systematic cutting of the bracken with a view to exterminating it was commenced on this plot in 1920, but as the method followed was very similar to that decided on for the experiment, it seemed worth while including the plot as an experimental plot and putting the results on record.

Previous to commencing the systematic cutting in 1920, the bracken had been cut in rotation with the bracken of other areas in the Park for use as litter, the last cutting for this purpose having been carried out in the autumn of 1919, at the time of which cutting the bracken was from 4ft. to 5ft. in height.

Since 1918, the field of which the plot forms a part has been stocked with cattle and sheep for about 10 months during each year.

This plot is not divided into June and July sub-plots, as at the commencement the plot was treated uniformly over its whole area as regards cutting.

Previous to the cutting of the bracken, the grazing of this plot was valued at 15s. per acre per annum.

It is not proposed to enclose this plot from the remainder of the field.

The soil on the plot is derived from the millstone grit, is on the heavy side and rests on a subsoil of stiff clay. It appears to be of good depth over the whole plot.

DETAILS OF CUTTINGS DONE.

As the gradient on this plot is very small and the surface fairly uniform, it has been possible to cut the whole of the bracken with a mowing machine.

The first systematic cutting was carried out in 1920 during the first week in June at which time the bracken averaged from three feet to four feet in height. All cuttings done since then have been done when the bracken has again made an average growth of about one foot over the plot.

Details of dates of cuttings, costs, etc., are appended.

PRESENT CONDITION OF THE PLOT.

The plot was inspected for the last time this season on October 5th, and on this occasion there were scarcely any shoots of bracken visible on the plot, those plants which were showing being only about 6ins. in height. The herbage of the plot appeared to be very good and there was a good show of wild white clover over the whole area.

Three holes 18ins. in depth were dug in order to sample the soil and to see whether the roots of the bracken had been killed by the treatment. It was found in all three places that there was still a large number of well developed healthy roots throughout the whole depth of soil examined, which state of affairs appeared rather surprising in view of the poor growth of bracken shoots.

DETAILS OF CUTTING OF BRACKEN ON ASHTON PARK PLOT.

Year.	*Dates and Particulars of Cutting.*	*Costs.*		
		£	*s.*	*d.*
1919	Autumn—Cut for litter. Bracken 4ft. to 5ft. high		—	
1920	First week in June.—Bracken 3ft. to 4ft. high. One man and two horses for six hours	1	5	0
	First week in September—Bracken 1ft. high. One man and two horses for six hours	1	5	0
	Total cost for 1920	2	10	0
1921	Third week in May—Bracken 1ft. high. One man and two horses for six hours	1	10	0
	Third week in July—Bracken 1ft. high. One man and two horses for six hours	1	10	0
	Total cost for 1921	3	0	0

THORN ERADICATION.

(*By Dr. J. A. Voelcker, M.A., F.I.C.*)

A field about 17 acres in extent was selected by Dr. Voelcker on the Ashe Warren Estate, Basingstoke, Hants, as a suitable one on which a demonstration of the advantage, or otherwise, of removing thorn bushes from grass land, might be carried out.

The estate is the property of Mr. T. L. Martin, who readily gave his concurrence to the work being conducted on his land.

The field is conveniently situated along the Kingsclere Road, and is only a short walk from Overton station (London & South Western Railway).

It was selected by Dr. Voelcker as being typical of a good deal of land in the neighbourhood, where thorn bushes have been allowed to grow and spread themselves.

The field has, for a long time, been down in grass, but being situated near a wood which swarms with rabbits, it has been almost neglected, and the herbage consists rather of weeds than of grass. Occasionally it has been run over by sheep, but nothing else has been done in the way of manuring.

The land, in its present condition, would certainly not be worth more than one shilling an acre. The soil itself is a thin gravel containing much stone, and with a subsoil of chalk which, in places, comes quite near the surface.

The herbage, such as it is, is very much the same over the whole of the field.

It was decided with Mr. Martin's concurrence, to take two areas of two acres each, running from the top to the bottom of the field (this latter being on a slope), to clear one-half entirely of the thorn bushes, and leave the other as it was.

Owing to the difficulty of obtaining labour, the work could not be begun till the autumn, but in the week October 17-22, the two selected acres were cleared.

The work was done by means of a Saunderson Tractor provided with a winding drum and cable.

The Tractor was placed at one end of the plot to be cleared, the cable run out to the far end and then drawn in. Chains of various lengths were attached to the end of the cable, run round the stems of the bushes, and the latter pulled up bodily. A course of about 20ft. wide was cleared at each winding.

The two acres took 32 working hours to clear, a driver and one man being required. The cost of actual pulling up was £8, and clearing up, burning thorns, etc., took two men two days more, making the total expenses under all headings up to date £9 10s. for the two acres.

Dr. Voelcker has again inspected the land since the clearing was done. This was accomplished without any particular difficulty and is quite satisfactory.

It was proposed to manure the field with Basic Slag and Kainit, but until steps have been taken to keep the rabbits off the plots, it is felt that any attempt to improve the land by means of manuring will be money thrown away.

It is hoped to have the plots surrounded with wire, after which manurial treatment may be adopted with some hopes of success.

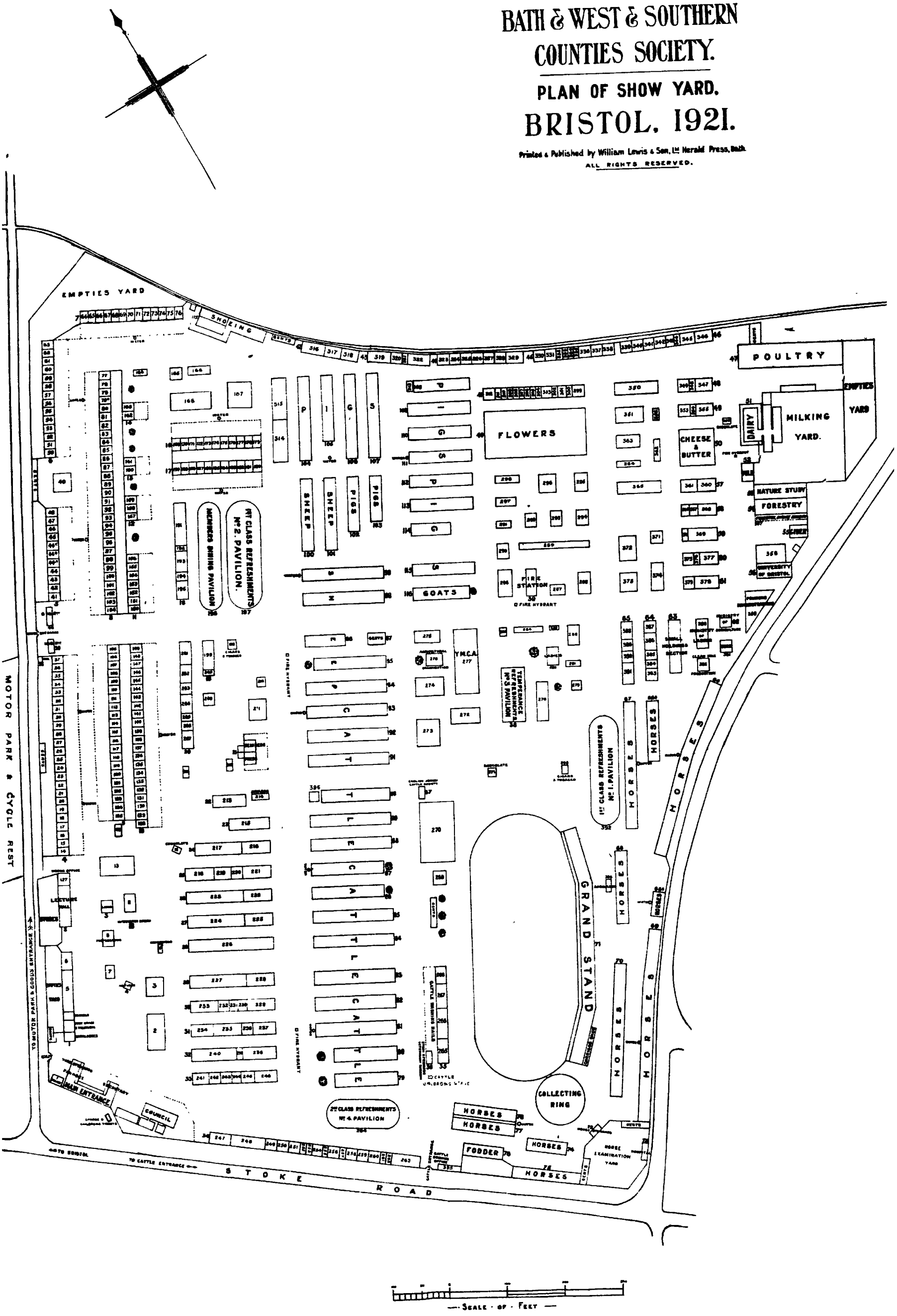
BATH & WEST & SOUTHERN COUNTIES SOCIETY.

PLAN OF SHOW YARD.

BRISTOL. 1921.

Printed & Published by William Lewis & Son, Ltd. Herald Press, Bath.

ALL RIGHTS RESERVED.



VIII.—THE SOCIETY'S EXHIBITION AT BRISTOL.

By F. H. Storr.

The Society's exhibition at Bristol was opened on Tuesday, May 31st, and closed on Saturday, June 4th. It is to be doubted whether at any period of the Society's history greater risks have had to be incurrred in deciding to proceed with the exhibition. The Ministry of Transport might at any moment have forbidden the holding of the show, or the Railways might have found it impossible to deal with the traffic from lack of coal. It is, therefore, all the more a matter of sincere congratulation that the quality and quantity of the exhibits have never been surpassed, and that nearly 100,000 visitors came to study the stock and implements, and especially the many new educational features which had been added to the Society's usual programme.

The Show was formally opened by the Lord Mayor of Bristol on the morning of May 31st. The President (Lord Bledisloe), in his speech of introduction, pointed out that individual enterprise in the improvement of our methods of agriculture and our live stock, was of far greater importance than legal enactments. The Society was prepared to carry out the traditional task, which it shared with the South-Western counties of England, of giving a lead to the whole country in re-establishing agriculture on a sound basis. It was in that spirit that the Society would that week elect as President the most live man among His Majesty's subjects—H.R.H. The Prince of Wales.

A comparison of the plan showing the arrangement of the show-yard, which faces this notice, with the corresponding plan for the 1903 meeting, will give a graphic representation of the large increase in the number of the exhibits since the Society's last visit to Bristol.

The following is a comparative statement of the entries in the Stock and Produce Classes in 1903 (when the Society last visited Bristol), in 1920 and in 1921 :—

	Bristol, 1903.		Salisbury, 1920		Bristol, 1921.	
Horses :—						
Agricultural	75		57		90	
Hunters, Hacks and Ponies	161		22		116	
Harness and Jumping	223		150		263	
	—	459	—	229	—	469

	Bristol, 1903.		Salisbury, 1920.		Bristol, 1921.	
CATTLE :—						
Devons..	35		23		30	
South Devons ..	42		27		37	
Shorthorns	54		71		76	
Dairy Shorthorns	..		..		41	
Herefords	53		26		56	
Gloucestershire..	..		4		6	
Sussex	11		6		..	
Red Poll	..		30		38	
Aberdeen-Angus	28		26		23	
British Friesian	..		48		56	
Jersey ..	168		88		121	
Guernsey	58		55		49	
Kerry and Dexter	38		36		68	
Dairy ..	88		109		78	
		575		549		679
SHEEP		164		244		216
GOATS		..		.		50
PIGS		130		227		435
POULTRY		348		363		405
FARM PRODUCE :—						
Cheese	75		51		71	
Butter and Cream	173		85		93	
Cider and Perry	78		42		35	
Bottled Fruit ..	..		12		..	
		326		190		199
		2002		1652		2513

Undoubtedly the feature of the Stock at the Bristol Show was the all round excellence of the exhibits, but special mention may be made of the fine hunter classes and the record entry of pigs.

The total amount offered in money prizes was £4,624 5s. 0d., made up as follows :—

Bath and West and Southern Counties Society	£2,539	15	6
Bristol Local Committee ..	810	0	0
Society of Merchant Venturers, Bristol	50	0	0
Gloucestershire Agricultural Society	158	0	0
Somerset County Agricultural Association	135	0	0
Shire Horse Society (or Medal) ..	15	0	0
Suffolk Horse Society	36	0	0
British Percheron Horse Society	33	0	0
Welsh Pony and Cob Society	40	0	0
Devon Cattle Breeders' Society	37	0	0
South Devon Herd Book Society	17	0	0
Shorthorn Society ..	30	0	0
Dairy Shorthorn Association	10	0	0
E. Ezra, Esq.	17	0	0
Carried forward ..	£3,927	15	6

Brought forward	£3,927	15	6
Hereford Herd Book Society	37	0	0
Gloucestershire Cattle Society	20	0	0
Red Poll Cattle Society	34	0	0
English Aberdeen-Angus Cattle Association	10	0	0
British Friesian Cattle Society	25	0	0
English Jersey Cattle Society	20	0	0
English Guernsey Cattle Society	38	0	0
English Kerry and Dexter Cattle Society	40	10	0
Lord Bledisloe, K.B.E.	24	10	0
Shropshire Sheep Breeders' Association	10	0	0
South Devon Flock Book Association	10	0	0
Kent or Romney Marsh Sheep Breeders' Association	17	0	0
Southdown Sheep Society	17	0	0
Hampshire Down Sheep Breeders' Association	20	0	0
Oxford Down Sheep Breeders' Association	10	0	0
Dorset Horn Sheep Breeders' Association	17	0	0
Dorset Down Sheep Breeders' Association	15	0	0
Exmoor Horn Sheep Breeders' Society	10	0	0
Suffolk Sheep Society	25	0	0
Ryeland Flock Book Society	15	0	0
Kerry Hill (Wales) Flock Book Society	15	0	0
British Goat Society	5	0	0
Countess Bathurst	5	0	0
Mrs. Reed Smith	2	2	0
Miss E. Skidmore	2	2	0
Miss Whitfield	1	0	0
Miss Skidmore	0	10	6
M. B. Bruce, Esq.	0	10	0
R. Turner, Esq.	0	5	0
British Berkshire Society	9	0	0
Large Black Pig Society	50	0	0
Gloucestershire Old Spots Pig Society	100	0	0
Wessex Saddleback Pig Society	30	0	0
Gloucestershire County Agricultural Education Committee	23	0	0
Somerset County Agricultural Instruction Committee	38	0	0
	£4,624	5	0

(In addition to the above, prizes were offered for Allotments and Small Holdings towards which the Bristol Local Committee contributed £140).

DONORS OF MEDALS, PLATE, ETC.

Lord Bledisloe; Bath and West Society; Gloucestershire Agricultural Society; Shire Horse Society; Hunters' Improvement and National Light Horse Breeding Society; Welsh Pony and Cob Society; National Pony Society; Hackney Horse Society; Chas. A. Hanson, Esq.; Shorthorn Society; Aberdeen-Angus Cattle Society; Argentine Aberdeen-Angus Cattle Society; English Kerry and Dexter Cattle Society; English Jersey Cattle Society; Southdown Sheep Society; British Goat Society; National Pig Breeders' Association; Gloucestershire Old Spots Pig Society; Wessex Saddleback Pig Society; Poultry Club.

The prizes for Milk-recorded Herds were continued, and prizes were given for the best-managed Dairy Farms and for Herds of Gloucestershire Old Spot Pigs. A separate report on the Farm Competitions will be found among the detailed reports which follow.

IMPLEMENTS.

In spite of the thoroughly unsatisfactory condition of trade and manufactures, records were set up in the space taken for machinery in motion and uncovered ground. The display of implements was excellent, many new inventions making their first appearance in public. Several of these, as was natural, had to do with farm tractors, though threshing machines, root thinners, apple pickers, and other farm implements were all responsible for new inventions. Perhaps the most outstanding feature of the general exhibits was the increasing use made of galvanised iron and concrete.

The following is a comparative statement of the space taken for machinery, implements and general agricultural exhibits :—

		Bristol, 1903.	Salisbury, 1920.	Bristol, 1921.
Machinery in Motion	feet run	1,400	1,960	2,394
Agricultural Implements ..	,,	4,295	2,300	2,160
Other Exhibits not strictly Agricultural	,,	1,695	355	475
Seeds, Cattle Foods, Artificial Manures, &c.	,,	1,238	1,120	1461
		8,028	5,735	6,490
Open Space for Farm and Horticultural Buildings, &c.	sqr. feet	33,825	18,430	51,408

MISCELLANEOUS DEPARTMENTS.

It may safely be said that this Bristol meeting will be known for the high standard reached in every department without exception. As initiating a new departure in the Society's activities mention may first be made of the Small Holders' Section, where implements suited to small-holders and methods of cultivation attracted large numbers of visitors. The exhibition was supplemented by outside competitions for small-holders and ex-service men in Gloucestershire and Somerset, and for the best managed allotments within 10 miles radius of Bristol. It is doubtful if any competition organised by the Society has created more interest locally, or has been more successful in achieving the object aimed at, namely in this case, of encouraging a town population to get the best results from their plots of land. The effect of this competition cannot be better illustrated than by quoting from the letter received from Mr. J. Randall, the Hon. Secretary of the Competition for the Bristol and District Small Holdings and Allotments Federation :—" May I thank the Bath and West Society for the splendid help and fillip they have given to the organised Allotment movement. They have given us—town-dwelling agriculturists—a very real and vital interest in the transactions of the Bath and West Society, and in agricultural matters generally. Thousands of men of sedentary occupations have found not only food but a new life, vigour and interest on their plots. Thanks to the Bath and West these men will feel encouraged to manage not only their own plot, but their Societies' Allotment Estates in accordance with the practice of the Champion Society."

The Horticultural Pavilion, in spite of some doubt as to its structural stability, successfully housed a magnificent display of flowers, shrubs, ferns and rock plants. Had the space available been twice as big it would hardly have been sufficient to accommodate comfortably the visitors who had to wait in long queues for admission. The directors of the Chelsea show had kindly arranged their dates so as not to clash with the Society's Meeting, and this enabled a thoroughly representative display to be collected.

Separate reports will be found of the Forestry, Nature Study, Dairy and Cider Sections, so that only a few special points need be mentioned here. Apart from the Forestry exhibit, the Long Ashton Research Branch of Bristol University arranged a most interesting exhibit, chiefly relating to its researches on fruit cultivation, among which were photographs illustrating Professor B. T. P. Barker's article in last year's Journal on root development in newly planted trees. The Working Dairy had an offshoot in Clean Milk Demonstrations, organised by the Reading Research Institute in Dairying. An excellent feature of this was the display in bold characters on the demonstration shed, of the precepts which were being graphically illustrated. The following statement shows the entries in the Butter-making, Milking and Shoeing Competitions for the years under review :—

	Bristol, 1903.	Salisbury, 1920.	Bristol, 1921.
Butter-Making	117	80	100
Milking	27	36	19
Shoeing	108	44	34
	252	160	153

These figures are to some extent misleading as the numbers of the competitors in the Butter-making competitions are now limited to 20 in each class, and many would-be competitors had to be turned away.

The President signalised his year of office by securing five speakers, eminent in various departments of agriculture, to deliver addresses in the Show Yard on each day of the Show. The names of the speakers: Sir Henry Rew, Dr. Stenhouse Williams, Dr. E. J. Russell, Mr. M. C. Duchesne, and Mr. A. E. Humphries, are a sufficient guarantee of the quality and authority of the matter of their addresses. It cannot be said that their audiences in the Show Yard were large, but the subsequent printing and publishing of the addresses ensured a wide publicity, and enough has been heard since the date of the Show to prove that this feature of the Show week has been highly popular, and is regarded by members of the Society as a valuable part of its educational activities.

Mention must also be made of another outstanding feature of the Show, the Colonial section. The Overseas Dominions not only provided their British audience with a wonderful display of Colonial produce, but they were themselves fully satisfied with the interest their exhibits aroused, and with the number of visitors who filled their stands during the whole period of the Show. How much this was due to advertisements of the Show, placed for the first time in Colonial newspapers, and to what extent it attracted Colonial buyers to Bristol, it is impossible to say, but the result was eminently satisfactory, especially in view of Bristol's close connection with the Overseas Dominions.

ATTENDANCE.

That the attendance at Bristol nearly reached six figures, is proof not only of the great interest roused locally, but also of the extent to which railways can now be replaced by motor traffic for the conveyance of passengers. If would have been unlucky indeed, in this year of drought, if the meeting had been interfered with by rain, and except for a very slight shower during the opening ceremony the weather was ideal, fine, but not too hot. The only difference made in admission charges was the addition of 1s. to the charge for the opening day, a change quite justified by the results. Below is a comparative table of admissions in 1903, 1920 and 1921.

Number of Admissions.			Admission Receipts.								
Bristol, 1903.	Salisbury, 1920.	Bristol, 1921.	Bristol, 1903.			Salisbury, 1920.			Bristol, 1921.		
			£	s.	d.	£	s.	d.	£	s.	d.
108,788	44,647	99,646	7,851	4	6	7,2[illegible]2	10	10	15,721	8	6

IX.—REPORT ON THE SOCIETY'S DAIRY DEPARTMENT AT BRISTOL.

By A. F. Somerville, Steward.

The Society having again decided to buy the milk of cows in the Show-yard, the price paid being fixed at 1s. per gallon, the Dairy Department was divided as follows :—

(1) Produce department for exhibits of cheese, butter and cream.

(2) The Working Dairy, in which competitions in butter-making were held and demonstrations were given.

(3) The Test Department, for the Butter-test and Milking trials.

(4) The Sales of Produce Department, where the milk of the yard was bought and milk, cream, butter and cheese were sold.

In consequence of the difficulty in getting cows brought to the show-yard the usual Milking Competitions were carried out at Mr. Green's farm, distant about half a mile from the yard. Mr. H. Bridgman was the Judge of these competitions, and Mr. S. J. Knight, as the Steward, supervised all the arrangements.

The Produce Department was under the control of Mr. W. H. Clark, as Steward, and the exhibits were judged, Cheese by Mr. J. R. Allen, Shepton Mallet ; Butter and Cream by Mrs. A. M. Luke, Plymouth.

The Working Dairy was under the control of Mr. A. H. Gibbs, as Steward, with Miss D. G. Saker (Dairy Instructress for the Somerset County Agricultural Committee), as Chief Assistant, and she was assisted by Misses P. M. Tucker and O. E. Masters from the Somerset Dairy Staff, and Miss H. Cadwallader, from the staff of the Gloucester County Agricultural Committee. Mrs. Luke was the Judge of the Butter Competitions.

The Test Department had as its Steward Mr. W. H. Clark and Miss F. Priday, (Dairy Instructress for the Gloucester County Agricultural Committee), acted as Chief Assistant.

The Sales of Produce Department were under the control of Miss

M. C. Taylor, from the staff of the Somerset Agricultural Committee, and she was assisted by Misses Parsons and Priscott, students under that committee. Messrs. A. Hobhouse and Read took the entire charge of the purchase of the milk, supplying the pavilion where the produce was sold, and keeping the accounts.

On the first day of the show demonstrations were given in the making of clotted cream, soft cheese (Gervais and Coulomnier), Cheddar and Caerphilly cheese, and butter; the use of the Gerber tester, etc.

On the second day there were demonstrations in making clotted cream and soft cheese, followed in the morning by a butter-making competition for Gloucester County Council students, who had not hitherto entered in a public butter-making competition, for which seventeen entered, and in the afternoon there was another competition for men and women, *bonafide* workers on a farm, for which twenty entered.

On the third day there were similar demonstrations in the morning. followed by a Butter-making Competition for Gloucester County Council dairy students, for which twelve entered, and in the afternoon another competition for students who had gone through a course of instruction at any County Council School, for which twenty entered.

On the fourth day demonstrations were given in the morning in making clotted cream and soft cheese, and also in the making of small cheeses, suitable for small holders. In the afternoon there was a butter-making competition for men and women, for which twenty entered.

On the fifth and last day of the Show there were demonstrations in making of clotted cream and soft cheese, and butter from some special breeds, including the milk from a Gloucestershire cow to see their churnability. In the afternoon there was a competition for the Society's Medals; the Gold Medal being won by Miss E. James, the Silver Medal by Miss C. Pantall, and the Bronze Medal by Miss R. James; Miss R. D. Every being Reserved.

The attendances both at the demonstrations and butter-making competitions were excellent throughout, showing the great interest taken by the public in the work at the Dairy; no seats were reserved, which gave an opportunity for a larger number to watch the work.

TEST DEPARTMENT.

The cows in the Milk and Butter Tests were stript at 5 p.m. and 5.30 p.m. on June 1st, and were milked the following day at 7 a.m.

and 7.30 a.m., in the morning, and again at 5 p.m. and 5.30 p.m. in the evening, for first and second milkers respectively. The samples for the Milk Test were taken by Mr. F. W. Simpson, Chief Inspector under the Food and Drugs Acts for the Bristol Corporation, and were subsequently analysed by Mr. Edward Russell, B.Sc., F.I.C., Lecturer on Hygiene and Chemistry to the University of Bristol.

The milk for the Butter Test was separated immediately after milking, and the cream was churned at 7 a.m. on June 3rd.

The cows competing in the Milk Test were divided into two classes: Class 147, for cows under 950lbs. live weight, and Class 148, for cows over 950lbs. live weight, the prizes being given by the Society. In addition, Gold, Silver and Bronze Medals were given by the English Kerry and Dexter Cattle Society for the three best Dexter cows competing in Classes 147 and 148.

For these two classes there were originally 45 entries, but 14 were withdrawn, leaving 31 animals competing, of which 16 were in Class 147 and 15 in Class 148. In Class 147 one cow failed to reach the standard; in Class 148 eight cows were below the standard.

In Class 147 the first prize went to Mr. G. Berry's Jersey, "Nimrod's Dinah 4th," with total points 54·70. The second prize was won by Mrs. Evelyn's Jersey, "Vervain's Bell 3rd," with total points 51·50; and the third prize was won by Mr. J. G. Asher's Jersey, "Dainty," with total points, 47·50; Mrs. E. Watts, Jersey, "Duckwing," taking the Reserve card with total points 46·50.

The Medals given by the English Kerry and Dexter Society were awarded: Gold Medal to Mr. A. C. King's "La Mancha Madeline," with 45·25 points; Silver Medal to Lady K. Hare's "Gort Peach 9th," with 39·55 points; Bronze Medal to Mrs. Nutt's "Fillongley Favourite," with 35·50 points.

In Class 148 the First Prize went to Mr. W. R. Wallace's British Friesian, "Attimore Pleasant Lass," with total points 78·50. The Second Prize was won by Mr. G. F. Ferrand's Guernsey, "Morland Diamond," with total points 55·00. The Third Prize was won by Mr. R. Bruce Ward's Jersey, "Ida," with total points 49·15; the Reserve being Mr. W. H. Chick's Devon, "Wynford Pill C," with 47·50 points.

Three Highly Commended cards for cows making over 45 points, and five Commended cards for cows making over 40 points were awarded in these two classes.

MILKING TRIALS.

FOR COWS UNDER 950LBS. LIVE WEIGHT.

No.	Owner and Cow.	Breed.	Date of Birth.	Date of last Calf.
	CLASS 147.			
527	Mr. G. Berry's "Tenda" ..	Jersey	25/7/15	4/2/21
528	Mr. G. Berry's "Nimrod's Dinah 4th"	,,	11/9/15	1/1/21
529	Mrs. Evelyn's "Vervain's Bell 3rd"	,,	5/6/13	9/1/21
530	Mrs. Hayes Sadler's "Dockweed"	,,	16/3/16	19/3/21
533	Mrs. Rudd's "Raleigh's Queen" ..	,,	21/7/17	5/5/21
535	Hon. Mrs. Smyth's "Grisette" ..	,,	3/3/16	16/3/21
540	Mrs. E. Watts's "Duckwing" ..	,,	30/8/10	29/3/21
542	Mr. S. G. Asher's "Petune's Princess"	,,	6/1/17	14/4/21
547	Miss C. B. Lucas's "Cowslip 74th"	,,	14/12/16	13/4/21
548	Miss C. B. Lucas's "Princess of La Godillie"	,,	22/11/15	23/1/21
703	Lady K. Hare's "Gort Peach 9th"	Dexter	10/2/13	10/4/21
707	Mr. A. C. King's "La Mancha Madeline"	,,	/3/13	8/4/21
708	Mrs. Nutt's "Fillongley Favourite"	,,	..	16/5/21
709	Mrs. Nutt's "Fillongley Farina" ..	,,	1915	14/3/21
711	Mr. T. A. Stephens's "Light Heart"	,,	15/4/17	30/3/21
752	Mr. J. G. Asher's "Dainty" ..	Jersey	14/1/14	6/12/20

MILKING TRIALS.

FOR COWS UNDER 950LBS. LIVE WEIGHT.

Days in Milk.	Service.	Milk Yield.	Points for Milk.	Lactation.	Total.	Awards.
		lb. oz.				
118	4/4/21	31 12	31·75	7·80	39·55	
152	5/3/21	43 8	43·50	11·20	54·70	1st Prize, £10
144	13/5/21	46 8	46·50	5·00	51·50	2nd Prize, £5
75	9/5/21	39 8	39·50	3·50	43·00	C.
28	N.S.	42 0	42·0	nil	42·00	C.
78	N.S.	29 12	29·75	3·80	33·55	
65	N.S.	44 0	44·00	2·50	46·50	Reserved
49	N.S.	40 4	40·25	·90	41·15	C.
50	N.S.	41 4	41·25	1·00	42·25	C.
130	N.S.	23 0	23·00	5·00	28·00	
53	N.S.	38 4	38·25	1·30	39·55	E.K.D. Society's Silver Medal
25	N.S.	45 4	45·25	nil	45·25	E.K.D. Society's Gold Medal and H.C.
17	N.S.	35 8	35·50	nil	35·50	E.K.D. Society's Bronze Medal
80	N.S.	24 8	24·50	4·00	28·50	
64	N.S.	22 0	22·00	2·40	24·40	Below standard for Fat and Solids
178	1/4/21	39 8	39·50	8·00	47·50	3rd Prize, £2

MILKING TRIALS.

FOR COWS OVER 950LBS. LIVE WEIGHT.

No.	Owner and Cow.	Breed.	Date of Birth.	Date of last Calf.
	CLASS 148.			
179	Mr. J. H. Chick's "Wynford Floss C"	Devon	8/10/14	12/5/21
180	Mr. J. H. Chick's "Wynford Pill C"	,,	23/7/13	14/5/21
311	Mr. H. T. William's "Maisie 4th"	Shorthorn	10/12/14	30/4/21
420	Major J. A. Morrison's "Kettleburgh Rosie 2nd C"	Red Poll	17/1/12	30/10/20
472	Mr. C. W. Edward's "Inwood Bertha"	B. Fries.	27/11/14	14/5/21
476	Lieut.-Col. W. E. Harrison's "Colton Roylette 2nd"	B. Fries.	27/3/17	3/4/21
478	Mr. G. Holt Thomas's "Beccles Peggotty"	B. Fries.	2/10/16	28/2/21
487	Messrs. W. & R. Wallace's "Knebworth Lilian"	B. Fries.	7/11/16	14/5/21
488	Messrs. W. & R. Wallace's "Attimore Pleasant Lass"	B. Fries.	18/9/18	8/5/21
537	Mr. R. Bruce Ward's "Ida"	Jersey	15/3/15	13/2/21
555	Mrs. E. Watt's "Merry Morn"	Jersey	31/5/12	8/4/21
642	Mr. G. F. Ferrand's "Fussey's Dora"	Guernsey	21/7/12	2/3/21
643	Mr. G. F. Ferrand's "Morland Diamond"	Guernsey	21/7/14	24/4/21
753	Mr. J. F. Broughton's "Fillpail"	Shorthorn	14/1/14	1/4/21
755	Sir C. Miles's "Genesta"	Shorthorn	2/3/16	18/4/21

MILKING TRIALS.

FOR COWS OVER 950LBS. LIVE WEIGHT.

Days in Milk.	Service.	Milk Yield.		Points for Milk.	Lactation.	Total.	Awards.
		lbs.	oz.				
21	N.S.	47	4	47·25	nil	47·25	H.C.
19	N.S.	47	8	47·50	nil	47·50	H.C and Reserved
33	N.S.	61	4	61·25	nil	61·25	Below standard for Fat and Solids
215	N.S.	43	4	43·25	nil	43·25	Below standard for Fat and Solids
19	N.S.	78	12	78·75	nil	78·75	Below standard for Fat and Solids
60	N.S.	58	0	58·00	2·00	60·00	Below standard for Fat and Solids
94	N.S.	67	4	67·25	5·4	72·65	Below standard for Fat and Solids
19	N.S.	33	12	33·75	nil	33·75	Below standard for Fat and Solids
25	N.S.	78	8	78·50	nil	78·50	1st Prize, £10
109	30/5/21	42	4	42·25	6·90	49·15	3rd Prize, £2
55	N.S.	39	4	39·25	1·5	40·75	C.
92	N.S.	40	12	40·75	5·20	45·95	H.C.
39	N.S.	55	0	55·0	nil	55·00	2nd Prize, £5
62	28/5/21	61	12	61·75	2·2	63·95	Below standard for Solids
45	N.S.	58	0	58·0	·5	58·50	Below standard for Fat and Solids

BUTTER TEST.

PARTICULARS OF COWS TESTED, YIELDS OF MILK AND BUTTER, AWARDS, ETC.

No.	Owner and Cow.	Date of Birth.	Date of last Calf.	No. of Days in Milk.
	CLASS 149—JERSEY.			
527	Mr. G. Berry's "Tenda"	25/7/15	4/2/21	118
528	Mr. G. Berry's "Nimrod's Dinah 4th"	11/9/15	1/1/21	152
529	Mrs. Evelyn's "Vervain's Bell 3rd"	5/6/13	9/1/21	144
530	Mrs. Hayes Sadler's "Dockweed" ..	16/3/16	19/3/21	75
532	Mr. S. G. Hough's "Nissa"	12/3/16	12/2/21	110
534	Mrs. Rudd's "Fire King's Tidy" ..	2/5/18	26/10/20	158
535	Hon. Mrs. Smyth's "Grisette" ..	3/3/16	16/3/21	78
537	Mr. R. Bruce Ward's "Ida"	15/3/15	13/2/21	109
540	Mrs. E. Watts's "Duckwing" ..	30/8/10	29/3/21	65
542	Mr. S. G. Asher's "Petune's Princess"	6/1/17	14/4/21	49
547	Miss C. B. Lucas's "Cowslip 74th"	14/12/16	13/4/21	50
548	Miss C. B. Lucas's "Princess of La Godillie"	22/11/15	23/1/21	130
551	Mr. J. H. N. Roberts's "Quaintness"	4/4/17	9/5/21	24
552	Mr. E. A. Strauss's "Derry's Fairy"	16/5/16	18/3/21	76
553	Mr. E. A. Strauss's "Gipsy Amira"	10/12/14	12/4/21	51
555	Mrs. E. Watts's "Merry Morn" ..	31/5/12	8/4/21	55
553	Mr. E. A. Strauss's "Fairlawne Poppy 2nd"	7/11/18	21/3/21	73
752	Mr. S. G. Asher's "Dainty" ..	14/1/14	6/12/21	178
756	Mrs. Rudd's "So Ladylike"	22/5/17	2/1/21	151
758	Sir G. S. White's "Honeysuckle of Honeywood"	2/9/18	11/1/21	142
	CLASS 150—GUERNSEY.			
642	Mr. G. F. Ferrand's "Fussey's Dora"	21/7/12	2/3/21	92
643	Mr. G. F. Ferrand's "Moreland Diamond"	21/7/14	24/4/21	39
644	Mrs. W. H. Palmer's "Donata 7th of Warren Wood"	1/1/13	11/5/21	22
650	Miss C. E. Hambro's "Rosie 2nd of Quatt's Vents"	2/6/18	24/12/20	160
759	H.R.H. the Duchess of Albany's "Bosiston Marigold" ..	27/2/15	1/4/21	62

BUTTER TEST.

PARTICULARS OF COWS TESTED, YIELDS OF MILK AND BUTTER, AWARDS, ETC.

Milk Yield in 24 Hours	Butter Yield.	Ratio, viz., lbs. to lbs Butter	Points for Butter.	Lactation	Total Points.	Awards
lb. oz.	lbs. oz.					
31 12	1 6¼	22·83	22·25	7·80	30·05	
43 8	2 1	21·09	33·00	11·20	44·20	Silver Medal
46 8	2 5	20·10	37·00	5·00	42·00	Cert. of Merit
39 8	2 6	16·63	38·00	3·50	41·50	Cert. of Merit
35 4	1 15¾	17·76	31·75	7·00	38·75	Cert. of Merit
33 4	1 9¾	20·65	25·75	11·80	37·55	Cert. of Merit
29 12	1 10¼	18·13	26·25	3·80	30·05	
42 4	2 3½	19·04	35·50	6·90	42·40	Bronze Medal
44 0	2 2½	20·40	34·50	2·50	37·00	Cert. of Merit
40 4	1 13¼	22·01	29·25	·90	30·15	Cert. of Merit
41 4	1 10	25·38	26·00	1·00	27·00	
23 0	1 0½	22·30	16·50	5·00	21·50	
30 12	1 5½	22·88	21·50	..	21·50	
47 12	2 3¾	21·37	35·75	3·60	39·35	Cert. of Merit
32 12	1 14¼	17·32	30·25	1·10	31·35	
39 4	2 1¼	18·88	33·25	1·50	34·75	
23 0	1 4½	17·95	20·50	3·30	23·80	
39 8	2 14¾	13·51	46·75	8·00	54·75	Gold Medal
27 8	1 11¾	15·85	27·75	8·00	35·75	Cert. of Merit
23 8	15	25·06	15·00	8·00	23·00	
	lbs. oz					
..	2 0½	20·06	32·50	5·20	37·70	2nd Prize
..	2 11½	20·46	43·50	..	43·50	1st Prize
..	2 2¾	18·30	34·75	..	34·75	
..	1 2	22·00	18·00	12·00	30·00	H.C.
..	2 2¼	22·77	34·25	2·20	36·45	3rd Prize

The following table gives the number of cows of each breed competing in Classes 147 and 148, the average yield of each cow and average number of days in milk :—

CLASS 147.

BREED.	NO.	MILK YIELD.	DAYS IN MILK.
Jerseys	11	37·74 lbs.	80·81 days
Dexters	5	33·18 „	47·8 „

CLASS 148.

BREED.	NO.	MILK YIELD.	DAYS IN MILK.
Jerseys	2	40·75 „	82·0 „
Guernseys	2	47·87 „	65·5 „
Devons	2	47·6 „	20· „
Shorthorns	3	60·3 „	46·6 „
British Friesian	5	63·28 „	43·4 „
Red Poll	1	43·25 „	21·5 „

The Butter Test was divided into two Classes : Class 149 for Jerseys, the prizes, Gold Medal or £10, Silver and Bronze Medals, being given by the English Jersey Cattle Society. Class 150, for Guernseys, the prizes, £10, £5 and £3 being given by the English Guernsey Cattle Society.

For Class 149 there were 21 entries, but of these one was absent, leaving 20 animals to compete.

The Gold Medal was won with a total of 54·75 points by Mr. S. G. Asher's " Dainty," which made 2lbs. 14¾oz. of butter from 39lbs. 8oz. milk, the milk ratio being 13·51lbs. milk to a pound of butter

The Silver Medal went to Mr. G. Berry's " Nimrod's Dinah 4th," with a total of 44.20 points ; she made 2lbs. 1oz. butter from 43lbs. 8oz. milk, her milk ratio being 21·09.

The Bronze Medal was won by Mr. R. Bruce Ward's " Ida," with 42·40 points ; she made 2lbs. 3½oz. butter from 42lbs. 4oz. milk. her milk ratio being 19·04.

Eight Certificates of Merit were awarded in this Class.

In Class 150 seven animals were entered, but two were withdrawn. The First Prize was awarded to Mr. G. F. Ferrand's " Morland Diamond," with total points 43·50 ; she made 2lbs.11½oz. butter from 55lbs. milk, her milk ratio being 20·46. The Second Prize was won by Mr. G. F. Ferrand's " Fussey's Dora," with 37·70 points ; the made 2lbs. ½oz. butter from 40lbs, 12oz. milk, her milk ratio being 20.06. The Third Prize was awarded to H.R.H. the Duchess of Albany's "Bosiston Marigold," with 36·45 points; she made 2lb. 2¼oz. butter from 48lbs. 12oz. milk, her milk ratio being 22·77.

The churning, which was commenced at 7.10 a.m., was finished about 10 a.m. My thanks are due to Miss Priday and the ladies who assisted at the churning. The thanks of the Society are also due to Mr. Simpson and Mr. Russell, who gave their services voluntarily in connection with the Milk Test, and I am also indebted to Mr. T. Hammond, secretary of the English Jersey Cattle Society for the valuable assistance given in the Butter Tests.

MILKING COMPETITION FOR GOATS.

For the first time in the history of the Shows of the Bath and West Society there was a Milking Competition for Goats under the regulations of the British Goat Society. The points to be awarded were as follows: For each 1lb. of milk, 1 point; fractions of a pound to ½oz. to be worked out in decimals. For each complete six days since last kidding (omitting the first 40 days), 1-10th of a point, with a maximum of 6 points. For each ¼lb. B.F., 5 points. For each ¼lb. solids, other than B.F., 1 point, less quantities to be calculated in decimals on same scale. In any milking, where B.F. is less than 3 per cent., 1 point to be deducted.

Unfortunately no scales for weighing milk were available, which registered less than 2oz., the British Goat Society has promised to provide special weighing machines for milk on any future occasion. The samples were taken by Mr. Simpson and the analysis of the milk was made by Mr. E. Russell.

The goats were stript at 6 p.m. on May 30th, and were milked at 7 a.m. and 5 p.m. on May 31st. The First Prize was won by Miss M. G. Callen's Anglo-Nubian-Swiss, "Keighley Patte," with a total of 20·07 points, her milk yield being 9lbs. 8oz. The Second Prize went to Miss E. Skidmore's Anglo-Nubian, "Edenbreck Tilda," with a total of 16·92 points; her milk yield being 7lbs. This goat also received a Q*. The Third Prize was awarded to Mr. C. R. Payne's British Saanen, "Firna," with total points 15·60; her milk yield was 6lbs. 4oz.

There were 11 entries, but one goat was absent; only one animal's milk was below 3 per cent. at one milking (morning).

I am much obliged to Mr. M. B. Bruce, a member of the British Goat Society, for the assistance he kindly gave me.

The table of the results of the competition is annexed :—

CLASS 204—MILKING.

No. of Goat.	Points for Milk.	Points for Lactation.	Points for Solids.	Points for Solids other than B.F.	Total.	Awards.
978	5·50	·8	4·86	1·95	13·11	
980	3·25	·8	3·55	1·15	8·75	
981	6·25	1·2	5·89	2·26	15·60	3rd Prize
984	5·00	·6	3·58	1·58	10·76	
985	5·50	·50	5·25	2·00	13·25	
986	4·50	·7	5·17	1·62	11·99	
989	5·75	·8	4·58	1·94	13·07	
990	9·50	·2	6·72	3·65	20·07	1st Prize
			Less 1·00			
			5·60			
991	4·50		4·34	1·63	10·47	
992	7·00	·80	6·72	2·40	16·92	2nd Prize and Q*

SALES OF PRODUCE DEPARTMENT.

The arrangements for the purchase of milk from the yard were similar to those at Salisbury, but an improvement had been made in the planning of the Working Dairy, the milk being brought through the Milking Yard to the back of the dairy. There was an increased demand by the public for milk and cream at the Pavilion ; and, in fact, all the milk bought could have been sold as milk, cream, soft cheese and butter. without reserving any of it for cream for the Butter-Making Competitions. Cream was, however, supplied from bought milk for all these competitions with the exception of 20 gallons of cream on one day, purchased at a cost of 20s. per gallon. On the other hand we had a considerable demand also for separated milk, a good deal being sold at the Pavilion at a very remunerative price, besides that sold to exhibitors in Pig Classes, who also took all our whey.

The difference between the cost of milk purchased, and the sales from the Working Dairy and Sales Department was £73 7s. 7d. profit, but this does not take into account working expenses.

My best thanks are due to Messrs. A. Hobhouse and Read, who gave up practically their whole time at the show to this somewhat monotonous task of purchasing the milk and keeping the Pavilion supplied with milk and its products, and also keeping the accounts, which further involved very long hours.

The sales at the Pavilion were very efficiently managed by Miss Taylor and her staff, and at a critical time when more help was urgently wanted, Mrs. Cary Batten very kindly gave most useful assistance both in churning and selling at the Pavilion, for which help we felt much indebted to her. Flowers kindly sent from the Horticultural Department, much added to the attractiveness of the Pavilion.

I cannot conclude without expressing my thanks to the Directors of the Somerset and Gloucestershire Horticultural Committees for allowing members of their staffs to give us such valuable assistance; and, though it may seem invidious to name any one of the latter, where all worked so well and so loyally, I must mention the name of Miss D. G. Saker, who, not only in the Show-yard, but also for some weeks previous to the Show, by corresponding with suppliers of dairy utensils and other articles required in the Working Dairy, both greatly assisted me and also saved the Society a good deal of expense. It was through Miss Saker that we obtained, free of cost, the loan of several aluminium dairy appliances from Messrs. Sutherland, Thomson & Co., and were able to hire 200 aluminium pails from that firm on exceptionally good terms.

X.—REPORT ON THE FORESTRY SECTION AT BRISTOL.

By Godfrey Lipscomb, Steward.

The Forestry Section in connection with the annual show of the Bath and West was started some 15 years ago by the Society for the purpose of stimulating and encouraging the practice of Forestry, and of calling attention to the undoubted possibilities of English timber for home use. It will, I think, be agreed that at Bristol the exhibits put forward went far to "make good" both the above aims. The Forestry Section at Bristol was by general consent considered the best the Society has so far got together, and the excellence and practical value of the exhibits inside the building, together with the demonstrations outside, constituted a distinct step forward and should have enabled those in search of Forestry information to obtain an answer to many of the questions and problems that face the grower of timber. It is satisfactory to note that the interest in Forestry and the genuine wish to conduct the business on the best possible lines to bring English timber into prominence, as well as to call attention to the fact that English timber can, with proper care as to seasoning, be used for practically all purposes for which foreign timber has so far been used, is inducing owners where they can to continue planting. Their operations are for the present mcuh restricted by the economic difficulties, and planting on a large scale must, as I said last year in my report, be left to the Government. It may probably be many years before the shortage of English coniferous timber, due to the present position, will be felt, but this must be so when the rotation reaches the war period, when so much timber was felled; and the subsequent years, during which it was possible for little planting to be done. As I write this report the first annual report of the Forestry Commission has been issued, and I should like to congratulate the Commission on the good work they have been able to accomplish so far with the very limited resources placed at their disposal by the Government. Both in their efforts to carry out a sound planting policy, to provide for the education in Forestry matters of those practising Forestry, and also to assist owners on technical points on which a Government Department can, if it will, render such valuable help, they are to be congratulated on their record.

Taking the Forestry Section in detail, in Class I the Charborough Park Estate this year secured the Gold Medal by an exhibit which showed great care in its preparation—an excellent collection of specimens showing damage due to insects, fungi, etc. It is hoped that another year this exhibit may be extended, with similar care, to cover more fully the ground for a *general* Forestry exhibit. Major Morrison took second with a small, but interesting, and well-staged exhibit. In the non-competitive class Major Morrison also showed a useful collection of articles made on his estate, largely by blind men.

In Class II. Major Morrison took first with a beautifully clean Scots Pine board. No second prize was given in this class.

In Class III. the Hon. Mrs. Smyth took first with a nice larch board from a tree 90 years old—a considerable age for larch. The Margam Estate took the Bronze Medal.

In Classes IV., V. and VI., Major Morrison took, in each case, the first prize, with excellent boards—the Spanish chestnut being a particularly nice bit of timber.

In the Field Gate Class (Class VII.) the Hon. Mrs. Smyth took first with a larch gate, and second with an oak gate, which stood the tests they were put through, in addition to being reasonable as to price—the price of the larch gate, complete with posts and ironwork, being £4 5s. 9d., and the oak gate similarly complete, £5 12s. 3d.

In Class VIII., the Great Western Railway Co. sent sleepers kindly taken up by them from various sections of their system to show that English timber creosoted is perfectly suitable for railway sleeper purposes. The sleepers shown were of elm, beech, oak, larch and Scots pine. The Forestry Commission sent a very good general exhibit carefully got together, and of considerable educational value. They arranged for a representative to be in attendance to explain the exhibits. The exhibit was designed to illustrate the development of the tree from the seed to timber, and therefore included collections of seeds, seedlings, examples of good and bad transplanting, as shown by the root system of the plant, various soils showing the tree growth they can support, insect diseases, fungoid diseases, and planks of various timbers demonstrating the different types of wood. A few specimen trees were shown from young plantations showing the growth of last year's annual shoot, varying from 3ft. to 4ft., and also some useful photographs and tables of yield, etc.

The Hon. Mrs. Smyth (per Mr. H. B. Napier) sent an excellent exhibit showing not only a good collection of specimens, but also a valuable exhibit of English timber, worked up in the estate yard into casement window frames, and two doors of spruce and elm respectively of really excellent quality and workmanship, showing that English timber is fully equal to the best foreign timber for this purpose. An instructive exhibit was a piece of Scots pine, of considerable age, that should, from its age and size, have cut into fine planks, spoilt by knots, pointing either to bad Forestry management in years gone by, or to the fact that the tree had been grown for ornament and not for use, large knots being, of course, a very serious defect in coniferous timber, a defect that is prevented if closer planting is resorted to. The photographs in this exhibit were excellent, and, in fact, through the whole section the photographs showed a considerable advance. Mr. Luttrell, of Dunster Castle, sent some fine specimens of timber, including some very good Brown Oak and Douglas Fir. The Director of the Royal Botanic Gardens, Kew, sent, in charge of Mr. Dallimore, an excellent and finished exhibit, including some useful photographs. This exhibit, as usual, was very good and helpful.

The English Forestry Association sent an instructive collection of over a hundred exhibits, showing English timbers from the seedling stage to, in many cases, the manufactured or semi-manufactured, article. The exhibit was got together with the main idea of showing the uses to which English timber can be put. In English oak the Association showed exhibits of railway wagon scantling sets, wainscot panelling and skirting, a handsome panelled door, cleft and sawn fencing, flooring and floor joists, match boarding, tessellated flooring, street paving blocks, etc. The ash exhibit consisted of samples of coach-builder's work, ash for railway and naval purposes, etc. An interesting exhibit in beech showed this timber as used by the boot and shoe industry for the purpose of making lasts, boot trees, etc., the exhibit commencing with a round billet 12 inches in diameter, and so on through the various stages to the finished article. In connection with this industry it is interesting to know that for this particular purpose beech of clean growth with a diameter of from 12 inches to 16 inches is required. An exhibit also by the English Forestry Association, which attracted considerable attention, showed examples of furniture, panelling, flooring, staircase and veneers manufactured from English elm which had been treated by a special process. Visitors found it difficult to believe that English elm could be so effective for this purpose. Elm used for flooring and carriage work was also shown in this section. An exhibit which created a great deal of practical interest was that showing elm and beech converted into wood paving blocks, 9in. by 3in. by 4in. deep. This exhibit, in addition to showing blocks in their green state, atmospherically dried, kiln dried and creosoted, also included specimen sections of elm and beech blocks which had been laid for a varying number of years, carrying heavy traffic, in the streets of Bath and Bristol, all of which bore testimony to the suitability of English timbers for street paving. In the soft wood section, samples of Corsican pine, spruce, larch and Scotch fir pit props were shown, also ash, oak and poplar for various colliery purposes. Samples of Douglas Fir and Sitka Spruce were exhibited, showing in many cases extraordinary growth, in particular, one exhibit of Sitka Spruce planted 12 years, had a total length of 35 feet. An exhibit of Douglas Fir, planted 16 years, showed a growth of 48 feet. Some useful photographs of individual forest trees and plantations in various stages of growth were shown. A special feature was an exhibit of seedlings and transplants, which are being grown under contract for the English Forestry Association, one particularly interesting exhibit being a comparison between Douglas Fir seedlings, two years old, and Douglas Fir one year seedlings, one year transplanted, from which it would appear that under certain conditions more satisfactory results can be obtained by lining out this variety as one year seedlings. Demonstrations were also given by the English Forestry Association in the cleaving of ash and in the making of Wattle hurdles, and also in the use of the planting board for transplanting seedlings. The use of the planting board, if properly managed, not only ensures the roots being properly placed, but saves a great deal of time.

A small, but useful exhibit, was sent by Mr. Melville Wills, not for competition. The Willow shown in the non-competitive class was a new feature. Interesting exhibits of Willow were sent by Messrs. Clarke, of Bridgwater, Mr. John Mawdsley and Mr. Joseph Sherrin.

In Class IX. the only exhibit was from the Margam Estate. Considerable interest is taken in the question and method of creosoting timber. Questions with regard to creosoting are constantly asked by visitors to the Forestry Section, and it is to be regretted that more exhibits were not sent in this Class.

It should, I think, be mentioned in this report that Mr. M. C. Duchesne, whose work in connection with English Forestry is well known, very kindly gave a lecture on the third day of the show on the marketing of English timber—a useful and carefully prepared lecture, which was listened to by a good and appreciative audience.

The best thanks of the Society are due to the National Fruit and Cider Institute, at Long Ashton, for the very kind help they gave in connection with the pruning demonstrations. The Institute planted and cared for the trees for demonstration purposes previous to the Show, and demonstrations were given daily during the show by Mr. Perrin, their expert, and were very well attended. The interest taken year by year in these pruning demonstrations may be taken as proof that visitors to the show are very glad to have the opportunity of obtaining practical advice at first hand, combined with actual demonstration on the living tree.

The thanks of the Society are also due to Mr. H. A. Pritchard, who again kindly acted as judge in this section.

XI.—REPORT ON THE NATURE STUDY AND HANDICRAFTS SECTION AT BRISTOL.

By H. M. Cundall, I.S.O., F.S.A.

The principal feature of the Exhibition was the admirable display of work from schools under the Bristol, Somerset and Gloucestershire Education Committees. The exhibits of each county were arranged under the direction of the individual committees.

Those from Gloucestershire were displayed collectively according to different sections, without the name of any particular school appearing prominently, while those from Bristol were classified under the different schools. The Gloucestershire method of arrangement afforded ocular demonstration of valuable co-ordination of educational subjects in the county; but it naturally led to a judicious selection by the authorities, and only the best work appeared. On the other hand in order to encourage individual effort the selection in Bristol was left entirely in the hands of the teachers to make such display as they considered advisable. This latter plan, which, doubtlessly, appealed to both the teachers and pupils, afforded a better idea of the work, which was being done in the individual schools. The arrangement of the Somerset exhibits followed the same system as that of Bristol.

The neighbourhood of Bristol affords an admirable field for school excursions for the study of nature, and two very interesting exhibits were contributed, showing the combined work of the pupils, as results of their excursions. One was a model of a pond and rockery, made by girls, aged from 12 to 14 years, attending the East Bristol Central School. It was constructed as a record of their journeys to study plant life in the neighbourhood. The other was a model in *papier-maché*, of the Avon Gorge, executed by the boys in the VIth and VIIth Standards of the Luckwell School. In addition, there were a sketch map and numerous geological specimens, classified and indicated on the model where they were found. It fully demonstrated the thorough manner in which the combined efforts of the pupils were carried out. The naturalistic arrangement of these two exhibits gave a pleasing effect and was most attractive. A system well worthy of being followed at similar exhibitions. The Avon Gorge is particularly well adapted for the study of geology, and the results of visits to it were also shown by the Upper Stand rd boys at the North Street Wesleyan School, by a collection of rocks and fossils found in the quarries, with diagrams showing the positions where they were found in the Gorge. A similar exhibit, contributed by the boys of South Street (Senior) School, with photographs showing group work in geology, was likewise very satisfactory. The North Bristol Central School sent a case of rock substances, a large portion of which were from the Bristol district, and many of the specimens had been found and brought in by pupils of the school.

Other good results in Botanical teaching and Nature Study, besides those of the East Central School, were exemplified by water-colour drawings and note-books relating to life histories of trees, flowers and insects, by Hotwells Girls' School, Eastville Girls' School, South Street School, and North Street Wesleyan School. The

Cotham Secondary School for Boys exhibited specimens of handicraft work, consisting of small useful articles, with working drawings, and a model of a suspension bridge, formed by half inch bamboo rods, and constructed on scientific principles. The exhibit contributed by the Elementary Handicraft Centres demonstrated the efficient manner in which Manual Instruction is being carried on in Bristol. The models shown were the work of boys under, 14 years of age, attending the Elementary Schools. They were grouped according to their various uses. One consisted of toys, such as a wheelbarrow, waggon, etc., for use of infants' schools; another of simple apparatus for illustrating elementary science lessons; and a third contained gardening tools and useful articles for the home. There were also some excellent examples of metal work, comprising articles made from waste tins.

The Somerset exhibits chiefly demonstrated the very useful handicraft instruction which is being carried on at Schools in rural districts in connection with gardening, poultry-keeping and bee-keeping. The work, as a whole, was of an excellent character; unfortunately the space available for its exhibition was insufficient for its being advantageously displayed. The principal objects, deserving commendation were contributed by the following schools: Weston-super-Mare Central Boys' School, specimens in wood and metal as applied to gardening, an instructive arrangement for experiments in the study of soils, and in-door work relating to school gardening; Long Ashton Parochial School. handicraft work in connection with school gardening, and domestic work, including jams, cakes, dried fruits and herbs; Chard Manual Training Centre, examples of woodwork suitable to simple rural pursuits; Portishead Manual Training Centre, apparatus used in connection with bee-keeping; Bruton Church of England School and Wrington Church of England School both showed apparatus used in connection with bee-keeping and poultry-keeping, amongst the exhibits of the former was a complete hive, with detailed drawings, and of the latter a chicken brooder; Wedmore Council School, practical apparatus with working drawings in connection with gardening and poultry-keeping; Exford School, rugs in coloured wool and specimens of net-making; and Dowlish Wake, examples of basket-work in raffia and cane. As already stated, the exhibits from Gloucestershire were displayed in different sections, comprising Nature Study and Rural Economy, without any special reference to the schools. The classification consisted of the following sections: (1) Wood work and metal work, with detailed drawings and apparatus made for use in connection with the garden, bees and poultry; (2) Exhibits illustrative of a course of instruction in poultry, bee, pig and goat keeping; (3) Exhibits illustrative of a course of school gardening, with notebooks, diaries, drawings and models; (4) Exhibits of school-made contrivances, with models, drawings and records illustrating lessons in meteorology, astronomy, surveying, practical arithmetic, practical geography geology, archæology, local history, local industries, bird and insect life, etc.; (5) Exhibits of carton and light woodwork, with associated drawing and arithmetic, showing the connection of the subject; (6) Exhibits from the Parents' National Education Union Schools, illustrating the foregoing subjects. The exhibits comprised in these sections were chiefly contributed by the following schools, viz.—Council Schools at Church Street, Stroud, Whaddon, Pilney, Berkeley, Henbury, and Thornbury; High School for Girls, Stroud; Farmers' Endowed School, Fairford; and the Church of England Schools at Maisemore, Stratton and Patchway.

The University of Bristol contributed an interesting and instructive exhibit of Handwork, executed by two-year women students in training, and used for teaching in Elementary Schools. Three types of work were shown: (1) Wooden toys and animals; (2) Raffia and cane baskets; and (3) Models for use as illustrations in history and geography lessons.

The exhibit of the Bristol Field Club was of considerable educational value. It consisted of four sections:—

(*a*) Entomological. Insects, pests and parasites. Insects useful to agriculturists.

(*b*) Ornithological. Birds of the Bristol area. Special: Protective coloration.

(*c*) Geological. Soils of the District—characteristic fossils.

(*d*) Botanical. Wild plants, medicinal and useful. Pollination of flowers by insects.

The Entomological Section was confined mainly to insects of economic importance, and of great interest to Agriculturists at large. Insects are generally all classed as enemies, but quite a large number are friends, and should be so recognised.

The exhibits, which were well arranged, included a series of insects (*Aphidius*, *Coccinella* and *Syrphidæ*), which show how the green fly is decimated by insects of the wasp, beetle and fly families, and explained the way in which these attacked this pest, with living examples of the Syrpid-fly larva at work.

Different forms of hoverer flies were exhibited, to show their helpfulness in fertilizing plants. Other interesting series of insects, including the minute wasp-parasite, which infests the eggs of other insects, were shown to demonstrate their usefulness to agriculture.

Ornithological Section.—The protective colouration of birds and their eggs, forms an interesting subject to the bird lover. Stuffed specimens of the nightjar, wry-neck and ringed plover, the first two migrants and the latter a resident species, were set up in their natural surroundings where they were almost invisible. The ringed plover standing over its clutch of four eggs laid on shingle, where they are almost invisible. There was also a collection of nesting boxes and feeding boxes instructive of a method of attracting useful birds for the purpose of study.

The Geology Section was represented by fossils collected from the Jurassic and Palaeozoic strata in the Bristol district. These formations are locally rich in fossil organisms, many of them being in a fine state of preservation. Those shown consisted of Ammonites and other forms characteristic of the various zones of the Oolitic and Liassic strata, also typical examples of Corals, and plants from the Carboniferous Limestone and Coal Measures.

Fine polished specimens of the curious local rock, known as Cotham Marble, and photographs of fossils were also exhibited.

The Botanical Section consisted of a collection of plants found growing wild in the Bristol District. The special object being to show specimens of plants of medicinal value, together with others illustrating the extraordinary contrivances which Nature provides to enable insects to pollinate the flowers and thereby effect the "set" of the various kinds of fruits.

The value of these exhibits were greatly enhanced by the presence of members of the club, who willingly gave explanations of the various objects to visitors to the Show ground.

The National Institute for Research in Dairying, Reading, contributed numerous charts and exhibits in connection with clean milk, and demonstrations of the sources of contamination, as well as many other valuable information of use to dairy farmers.

The Somerset and Gloucestershire branches of the Federation of Women's Institutes' exhibits demonstrated the useful work which is being produced in village centres. They consisted of toys, baskets, gloves, raffia work, etc. The Clifton Arts Club showed jewellery, pottery, leatherwork, basketry and needlework, executed by its members.

In the section devoted to work of Disabled Sailors and Soldiers basket-work, fancy goods and toys were exhibited by the Neurological Hospital, Ashton Court, Bristol, and the Curative Workshops, Pensions Hospital, Bath. Basketwork of all kinds were also shown by the Royal Blind Asylum Workshops, Bristol, and their Blind School at Westbury-on-Trym.

Although not coming strictly within the scope of the Nature Study Section, a very interesting pictorial record, tracing the evolution of the breed of Shorthorns, lent by Mr. William Parlour. of Darlington, consisted of sixty engravings, the earlies being dated 1779, and photographs of the breed, chronologically arranged.

XII.—THE EXHIBITION OF CIDER AT BRISTOL.

By Major E. W. Farwell, Steward.

The entries of cider at the Bristol Exhibition in 1921 numbered 35, as compared with 42 at Salisbury in 1920.

The classes were open to Growers or Makers, and money prizes or medals at the option of the prize-winners, were offered in each of the classes, which were as follows :—

CLASS 239.—Cask of not less than 9 and not more than 30 gallons of cider, made in 1920, of a specific gravity not exceeding 1·015 at 60°Fahr.

CLASS 240.—12 Bottles of cider, made in 1920, ditto.

CLASS 241.—Cask of not less than 9 and not more than 30 gallons of cider, made in 1920.

CLASS 242.—12 Bottles of cider, made in 1920.

CLASS 243.—12 Bottles of cider, made in any year previous to 1920.

Samples from each exhibit were submitted to Mr. F. J. Lloyd, F.C.S., for analysis, and particulars of these analyses are set out in the accompanying table. Three entries were disqualified for exceeding the maximum specific gravity of 1·015 in the classes for Dry Cider.

Professor B. T. P. Barker, M.A., The National Fruit and Cider Institute, Long Ashton, was the judge appointed by the Society, and the following are his criticisms on the exhibits.

Class 239.—“*Dry*” *Cask Class,* 1920 *made Cider.*—Only four entries, one of which was disqualified for exceeding the specific gravity limit. Of the remainder, the first prize sample was a light, clean, cider, which gained its place more by reason of defects in the other exhibits than by any special quality of its own. Second prize was awarded to an exhibit which, while possessing more positive qualities than the former, was somewhat marred by a too-pronounced bitter character. The remaining entry showed slight signs of acetification.

Class 240.—"*Dry*" *Bottled Cider*, 1920 *made Cider.*—Of the six entries two were disqualified for exceeding the gravity limit. First and second prizes were given to samples shown in good condition, but devoid of any marked character. Both were clean in flavour, but thin in body, the second prize sample especially so. Another flat and featureless cider gained the third prize. The class as a whole was weak, which to some extent was doubtless accounted for by the indifferent quality and limited supply of the 1920 season apple crop.

Class 241.—"*Sweet*" *Cask Class*, 1920 *made Cider.*—The competition in this class was weakened by the fact that three of the samples showed distinct signs of various disorders to which cider is liable, while one of the remaining exhibits would have been more in place in Class 239. The first and third prize samples were relatively full-bodied and fruity, the former being very sweet. In both instances the flavour was not quite so clean as could have been desired. Considering the season, the quality was very fair, otherwise. They were separated by an entry which was superior to either as regards cleanness on palate, but deficient in fruity character.

Class 242.—"*Sweet*" *Bottled Class*, 1920 *made Cider.*—The entries in this class represented a very fair average of merit, taking into account the general indifference of the 1920 vintage. That awarded first prize stood out in rather marked contrast from the remainder on account of its relative richness and body. Most of the others were of a brisk, light type, clean in flavour, but showing the deficiencies of the season in a lack of definite character and body.

Class 243.—*Bottled Cider made previous to* 1920.—This class attracted the largest number of entries, and, as was to be expected in view of the poverty of the 1920 vintage, represented distinctly the highest standard in the Show. The first prize was gained by a remarkably rick and fruity cider, pleasant and clean in flavour and full-bodied. While it showed some signs of maturity it is unusual to find in a class for "old" cider an exhibit retaining so much of the "fresh fruit" character. The sample awarded second prize showed more evident signs of age, being a well-matured brisk,

CIDER EXHIBITS AT BRISTOL, 1921.

Class.	No.	Exhibitor.	Specific Gravity.	Alcohol by Volume.	Acid.	Solids.	Original Solids.	Remarks.
239	1	H. J. Davis	1·012	5·72	·48	5·03	14·17	3rd Prize
	2	V. J. Gazzard	1·033	4·96	·69	10·38	18·24	Disqualified
	3	J. M. Parry & Co. (Ltd.)	1·004	5·00	·30	2·55	10·45	2nd Prize
	4	Pullin Bros.	1·012	5·23	·39	4·82	13·18	1st Prize
240	5	H. J. Davis	1·013	5·71	·41	5·01	14·11	3rd Prize
	6	Ditto	1·014	5·95	·44	4·72	14·22	
	7	V. J. Gazzard	1·036	4·61	·72	10·80	18·06	Disqualified
	8	J. M. Parry & Co. (Ltd.)	1·016	3·85	·52	5·21	11·41	Ditto
	9	Pullin Bros.	1·012	5·23	·42	4·77	13·13	1st Prize
	10	Ridler & Son	1·014	5·14	·66	5·00	13·18	2nd Prize
241	11	H. J. Davis	1·015	5·36	·37	5·63	14·25	
	12	Ditto	1·020	4·68	·53	6·58	14·00	
	13	V. J. Gazzard	1·024	5·18	·40	8·33	16·59	1st Prize
	14	J. M. Parry & Co. (Ltd.)	1·013	4·40	·29	4·67	11·57	
	15	Pullin Bros.	1·037	3·00	·52	10·71	15·51	3rd Prize
	16	Ridler & Son	1·028	3·30	·68	8·27	13·47	2nd Prize
	17	J. B. Taylor	1·011	5·86	·39	4·78	14·14	
242	18	H. J. Davis	1·015	5·53	·35	5·48	14·34	
	19	Ditto	1·020	4·78	·57	6·45	14·03	Reserved
	20	V. J. Gazzard	1·035	3·74	·45	10·48	16·36	1st Prize
	21	J. M. Parry & Co. (Ltd.)	1·010	4·86	·53	3·77	11·49	
	22	Pullin Bros.	1·038	2·81	·49	10·68	15·10	Commended
	23	Ridler & Son	1·027	3·36	·74	7·60	12·92	3rd Prize
	24	Ditto	1·033	3·22	·54	9·54	14·66	2nd Prize
243	25	W. G. Davis & Son	1·031	4·83	·46	9·32	16·98	
	26	H. J. Davis	1·011	5·94	·45	4·68	14·16	
	27	Ditto	1·019	4·02	·29	5·93	12·35	H.C.
	28	Ditto	1·025	4·52	·43	7·82	14·96	H.C.
	29	V. J. Gazzard	1·038	4·27	·67	11·13	17·87	1st Prize
	30	H. Gwynne Jones	1·013	4·59	·54	4·75	11·99	
	31	Absent	..	..	..	..	..	
	32	J. M. Parry & Co. (Ltd.)	1·018	3·75	·49	5·30	11·20	3rd Prize
	33	Pullin Bros.	1·021	4·50	·47	6·55	13·65	H.C.
	34	Ridler & Son	1·026	3·58	·72	7·42	13·08	Commended
	35	Ditto	1·030	3·52	·64	8·60	14·14	2nd Prize

clean, cider, of very fair body. The remaining prize-winning sample was of similar type, but hardly of the same standard of quality. The other exhibits gaining mention in each case well-earned that distinction.

General Remarks.—From the foregoing it is evident that the standard attained in these competitions for 1921 does not rank very high in comparison with some previous years. For this the short crop and indifferent quality of the 1920 apples must be held largely responsible, the materially higher standard reached in Class 243 emphasizing the point. That class, indeed, compared favourably with the corresponding classes in several previous years. As in most years, when body and character are deficient, the typical "Somerset" ciders do not take their usual high place in the prize list. It would seem that their preponderating bitter-sweet character, while adequately balanced by other qualities in an average season, is left too conspicuous in a year like 1920, when those other features are reduced.

XIII.—REPORT UPON THE BEST MANAGED FARM COMPETITION 1921.

By Douglas T. Thring, F.S.I.

The Classes were :—

No. 151.—Best Managed Farm with a herd of not less than 30 Dairy Cows, the property of a "bona fide" Yeoman or Tenant Farmer residing within 25 miles of the Guildhall, Bristol.

No. 152.—Ditto, with a herd of over 15 and under 30 Dairy Cows, the property of a "bona fide" Yeoman or Tenant Farmer, residing within 25 miles of the Guildhall, Bristol.

Both of these classes were subject to the condition that the state of the buildings and the general management and condition of the farm would be taken into consideration. It will be noticed that the qualification for each class is the number of dairy cows kept and not the number of acres farmed or the number of the stock kept, The term, general management and condition of the farm, is a very wide one and includes the continuous management of both grass and arable, besides ditches, fences, drains, ponds, etc.

The prize is offered for a farm where the dairy herd is the main object and the farm managed for a series of years with a view to the greatest profit. It appears that when dairy farming is carried on on land that is more suitable to some other kind of farming the farm would not come under the term "best managed" and also that the arable land is to be taken into consideration primarily in so far as it affects the herd. The consideration of the labour employed, the kind and amount of feeding stuffs and the manures bought and used on the farm are important, besides the conservation and distribution of manure on the farm.

One of the first questions to decide was whether the limiting qualification of the number of dairy cows implied that the farm was to be considered from the point of view of the dairy production only, or whether the rearing of all manner of stock, either for use on the farm or for sale, was also to be considered. The view adopted was that all kinds of stock were to be judged without any limitation to one particular kind. This point is believed to be of importance, for, in those dairy herds where the calves are sold off the farm at the earliest possible date, it is open to discussion whether the calves of cows recorded in the British Dairy Shorthorn Association, or in any other Dairy Herd Book, command a higher price than the calves of ordinary cows. Pigs, sheep, horses and poultry, were all considered as coming within the term "management." The number of farms entered for the prizes this year was disappointing, three entries in the larger class and two in the smaller. All the farms entered were managed for the purpose of increasing the production of milk and of obtaining a higher price for all stock reared. The inspection of these farms fully demonstrated the importance of the work carried out by the Milk Recording Associations. It was a pleasure to see that the farmers in the West of England appreciate this work as helping them both to produce more milk and to improve the quality of their herds.

This record enables the farmer to weed out with certainty any cow that is not up to the farmer's standard. This weeding out process has the effect not only of increasing the production of milk, but of increasing the number of cows eligible for the Dairy Shorthorn or any other Dairy Breed Stock Books, thus giving the farmer more stock with a record behind them to sell and to rear. It was clearly shown that to obtain a herd of dairy cows eligible for the Dairy Shorthorn Association it is better to start with foundation cows than with cows already on the Shorthorn Book.

The farms entered were all well managed; the quality of the stock being up to a high average both as regards cattle and pigs.

I should like to take this opportunity of thanking all the competitors for furnishing me, at the cost of considerable time and trouble, with all the information required; and especially for allowing me to inspect their accounts.

Class 151.—Dairy Herd of not less than 30 Cows.—First prize, Mr. E. G. Harding, Foxcote Farm, Grittleton, Chippenham.

This farm of 400 acres consists of 92 arable, 308 grass. Mr. Harding keeps 116 head of cattle, of which about 63 cows are in milk; besides which he rears stock for the upkeep of his herd and for sale. The pigs, about 120, are not pedigree, and are chiefly fatted out in the yards and buildings during the summer.

The cattle are Shorthorns, and are of a very even and high class quality. The milk record for 42 cows averaging 786 gallons per year per cow is very high. Great care has been taken to bring this herd up to its present high standard not only as to milking qualities but also as to size and shape and colour. This has not been accomplished without considerable expense, the bills for feeding-stuffs and cakes being over five times the amount of the rent.

The state of the farm and Mr. Harding's accounts show clearly that this large expenditure has been more than fully justified by results.

This farm is not situated on the best dairy land, and is on that account all the more interesting, showing, as it does, how a farmer with a constant eye on the improvement ot his pasture can produce so much milk from land not of the best quality.

The management of this farm is excellent, and I had no hesitation in awarding the first prize to Mr. Harding. The old idea that continuously selling milk off it robbed a farm, is shown by the management of this one to be a complete fallacy. Personally I have seen many farms improved enormously, where the old method of rearing stock only, was displaced by the selling of milk all the year round from a dairy herd, coupled with the rearing of a certain amount of growing stock.

Class 151.—Dairy Herd of not less than 30 Cows.—Second Prize, Mr. William Butler, Gatcombe Farm, Flax Bourton, Bristol.

This farm of 382 acres consists of two parts. One part of 172 acres of second quality grass land, and lies up a steep hill five miles off. The acreage of the land at his home farm is 210, 32 being arable, the land being of really good quality.

The cattle consists of 126 head of Shorthorns. Mr. Butler keeps 45 cows in milk, and rears young stock, both for the upkeep of his herd and for sale.

This farm is well managed in every respect. The cattle are of very good quality, many of them being in Coates' Herd Book. Mr. Butler is fully alive to the importance of the output of milk per cow, which is shown by the fact that 30 cows gave averages of 620 gallons per cow, the cows being kept in the fields in the daytime both in winter and summer. Mr. Butler's herd will become more and more recognised both for breeding and milking properties with the result that his young stock will command a ready sale at really good prices.

CLASS 151.—Dairy Herd of not less than 30 Cows.—Third prize, Mr. W. W. Stevens, Manor Farm, Alderton, Chippenham.

This farm of 479 acres consists of 381 acres of grass and 98 of arable. Mr. Stevens keeps 107 head of Shorthorn cattle, of which 49 cows are in milk, besides which he rears young stock. The cattle are a very good lot, taking into consideration the fact that Mr. Stevens has been at the Manor Farm only four years. The horses also deserve mention. Mr. Stevens, in the course of a few years, no doubt will attain a more even quality, his young stock showing great promise. Mr. Stevens is not afraid to spend money, and his management will, I hope, bring him shortly into the front rank of farmers.

I recommend the 3rd Prize to be awarded to this farm in spite of the small number of entries, as the farm is well worthy of a prize.

CLASS 152.—Dairy Herd of over 15 and under 30 Cows.—First Prize, Mr. Henry Lear, Bottom's Farm, Doynton, Bristol.

Mr. Lear, who is a working farmer, has bought his own farm of 220 acres, which consists of 160 acres of grass and 60 of arable. Mr. Lear keeps 69 Shorthorn cattle, 19 of which are registered in Coates' Herd Book. The dairy herd consists of 25 cows, the milk being sold in the winter and cheese being made in the summer. Mr. Lear's aim is to breed the double purpose cow and to continue to sell his young bulls at good prices. He is now breeding from bulls of a milking strain.

The Gloucester Spot pigs are quite a feature of this farm.

The milk yield per cow (24 cows) averaged 541 gallons. This farm is not on the best land, but is, on the whole, well managed, the grass land being gradually improved. Mr. Lear has been occupying the farm for 11 years. The milk yield would, no doubt, have been higher if Mr. Lear had turned his entire attention to producing milk instead of pedigree stock earlier than two years ago.

Class 152.—Dairy Herd of over 15 and under 30 Cows.—Second Prize, Mr. Thomas Mansfield, Winterbourne Court, Glos.

This is a very interesting farm. Mr. Mansfield's interests did not lie in farming before he took Winterbourne Court with a few acres of good land, about three years ago, when the farm was divided into small holdings. He afterwards took some more land not well suited for dairying some distance away, and has now developed into a very keen farmer, spending nearly the whole of his time looking after his farming interests. The capital in this farm is very considerable for its size, and the accounts show a good yearly return.

The farm consists of 116 acres, 16 of which are arable. The land is not at all conveniently situated or well suited to Friesian cattle, and besides that the rent paid is considerable. The Stock consists of 48 pedigree Friesian cattle, 18 being in milk. The average yield per cow (12 cows) was 812 gallons. Butter is made and no complaint has ever been made of the lack of butter-fat, which Mr. Mansfield tells me averaged 3-60. The milk skim is fed to the calves and pigs. The Friesian stock are a very even lot and, on the whole, well marked. They are very well looked after and are kept out all day in the winter.

About 60 Large Black pedigree pigs, of very good quality, are kept. The Shire horses, all in the Book, are very good.

The fact that Mr. Mansfield was only able to show " management and condition " for a short period was to him a serious disadvantage. Undoubtedly the results he has already obtained are very encouraging and show what can be done in a short time on moderate land, where there is a sufficiency of capital.

An inspection of this farm in two or three years' time would be very interesting.

XIV.—SMALL HOLDINGS COMPETITION, BRISTOL MEETING 1921.

By A. R. White.

Class 1.—Small Holding of over 15 and under 50 acres, situated in Gloucestershire or Somerset.—Two entries.

No. 2 entry, awarded first prize, comprised 32 acres of pasture land, upon which were fed 7 milking cows, 5 yearling heifers, 6 weanling calves, 2 horses, 2 pigs, 100 head of poultry. It may be noted that the tenant's occupation previous to taking over this holding, was that of a mason.

No. 1 entry was awarded second prize. It contained arable as well as pasture land ; the corn crops were not good, but I was informed the land was taken over in a very bad condition at Michaelmas, 1920, and that being so, considerable cultivation must have been expended to bring it into its present state.

Class 2.—Over 1 and under 15 acres, situated in Gloucestershire or Somerset.—One entry.

I did not consider this holding was of sufficient merit to justify the award of more than a second prize.

Class 3.—15 and under 50 acres, situated in Gloucestershire. Ex-service men.—Three entries.

No. 2 was awarded first prize. This holding gained the premier position in Class 1, as above.

No. 4 secured second prize. This holding comprised 25 acres arable and 22 of pasture, upon which were kept 6 dairy cows and 4 yearling heifers. At the time of my visit the cattle were being fed from produce, principally grown on the cultivated land. Some of the arable land was in a foul condition, but the tenant assured me it was in a very bad state when taken over at Michaelmas last.

No. 5 gained third prize. 24½ acres of pasture and 7 acres of arable, upon a portion of which was growing a very poor crop of wheat. Six cows and two horses were kept; and the holding appeared to be understocked.

Class 4.—Over 1 and not exceeding 15 acres, situated in Gloucestershire. Ex-service men.—Six entries.

With the exception of No. 7 the competitors were market gardeners, and generally speaking, the condition of the land and the produce growing thereon reflected great credit on the occupiers.

The competition was very keen, and there was little to choose between No. 9 and No. 10 holdings, the former, however, was awarded first prize, whilst the latter secured the second. No. 13 gained third position.

The principal crops grown were parsnips, peas, beans, carrots, onions, potatoes, for which a ready market was close at hand.

CLASS 5.—15 and under 50 acres, situate in Somerset. Ex-service men.—Ten entries. No. 18 withdrawn.

No. 20 easily gained the first prize. This holding contained 32 acres of pasture and 18 acres of arable land. The stock comprised 9 dairy cows, 2 two-year-old heifers, 3 yearling heifers, 4 weanling calves, 2 sows and 10 fat pigs, all of a high standard. The arable land was in good condition and the crops growing thereon were considerably above the average.

No. 15, awarded second prize, contained 27 acres of pasture land. Great improvement had taken place in the condition of this holding since it was taken over by the present tenant in March, 1920.

No. 16 secured third prize. This holding contains a large part of arable land, which was stated to be in more or less a derelict condition when the tenancy commenced last year. It shows great improvement. There were 12 good dairy cows of considerable merit on this holding.

No. 21. This holding is situated on the Mendips, and fully deserved the award of an extra prize.

No. 9. This, which came very near to securing a prize, was farmed by a lady, whose management showed considerable skill and energy, and she is to be complimented on her good work.

CLASS 6.—Over 1 and not more than 15 acres, situated in Somerset. Ex-service men.—One entry.

This fully deserved a first prize. It comprised 8½ acres of arable land and was devoted principally to the growth of market garden produce. The crops were looking well and showed careful attention.

GENERAL REMARKS.

I understand that much of the land (including the hedges and ditches) which I inspected, was in a very bad condition when taken over by the County Council, as recently as last year, and, no doubt, the small holders have been severely handicapped in bringing their holdings up to such a high standard as one would wish, this applies especially to the arable land. It is obvious that very considerable work had been carried out (one tenant assuring me that he had expended no less than £100 on his hedges and ditches during the past season), and in course of a few years there is every probability of much further improvement.

I should like to take this opportunity of urging upon Small Holders the advisability of rearing their own cattle, and on a portion of their arable land of growing market garden produce in preference to such small quantities of corn.

XV.—BRISTOL CHAMPION ALLOTMENT COMPETITION, 1921.

By G. W. Hollingworth and A. D. Turner.

On July 18th, 19th and 20th, we made our inspection of plots on the various allotment estates which had been awarded prizes by the local judges and were entered for championship prizes offered by the Society for a 20 and 10 perch plot respectively. In making the inspection the scale of marks was the same as that used by the local judges, and 52 plots were entered for competition in the two classes.

Speaking generally, we found that the allotments had suffered severely through the drought, but on the plots which won prizes in the local competition it was easy to see that care and good cultivation had to a considerable extent overcome the influence of the abnormally dry season. In the case of the most important crop, *i.e.*, potatoes, the survey of allotments over the whole area included in the Bristol Federation demonstrated the advantages in a dry season of planting new Scotch seed as compared with local grown potatoes. In fact one could not have a more striking demonstration of the advantages of seed change in potato culture.

For the purpose of this report we have named five allotment holders in each class who gained the highest number of marks, as follows :—

Twenty Perch Plots. *Maximum Points*—154.

Society.	*Entry No.*	*Name of Holder.*	*Points awarded.*
Warmley	113	A. Parslow	106
Filton	304	E. J. Baker	100
Horfield	244	W. Bowden	93
Bedminster	56	H. Perry	93
Fishponds	183	C. Holbrook	91

The first-named and champion plot in the 20 perch class approaches the ideal of what we would like to see in the majority of allotments. It is a typical working man's plot, containing a heavy return of really useful family vegetables. It is evident that Mr. Parslow has obtained this perfection purely by hard work, constant attention and by the use of good seeds of useful varieties. We were much impressed by the general excellence of this plot and wish to congratulate Mr. Parslow on the results of his skill and labour.

Ten Perch Plots. *Maximum Points*—154.

Society.	*Entry No.*	*Name of Holder.*	*Points awarded.*
West Bristol	318	G. H. Harford	114
Horfield	285	J. T. Wall	108
Fishponds	158	J. J. Wood	106
Fishponds	166	H. E. Gridley	95
Bedminster	59	G. Parker	90

It would be difficult to conceive a more excellent plot than the champion in this class, being admirably arranged, and all crops are in extraordinary good condition, showing very great skill on the part of the plot holder. The standard of this particular plot is much above that which could reasonably be expected from the average allotment worker, and it serves as a striking demonstration of what can be done on a plot of 10 perches. Mr. Harford is to be congratulated on the condition of his plot and the crops, and especially so when the very difficult climatic conditions of the season are considered.

Among the 20 perch plots we desire to make special mention of that entered by Mr. E. J. Baker, of the Filton Society, and in the 10 perch competition of those cultivated by Mr. J. T. Wall, Horfield Society, and Mr. J. J. Wood, of the Fishponds Society.

There can be no question about the stimulating effect of a competition of this kind and its educational value can hardly be over estimated. While we congratulate the Bath and West Society and the Bristol Federation of Allotment Holders on their initiative and enterprise, we feel that a special word of praise is due to Mr. Jas. Randall, of the Agricultural Organisation Society, for the enthusiasm he has displayed over the competition from the outset and the admirable way in which the local arrangements were made. But for Mr. Randall's help and guidance the task of judging—which was of no light order—would have been extremely difficult.

In concluding this report we wish to emphasise the fact that

every prize-winner, and the two champions in particular, owes his success to the food value, quality and variety of the produce grown on his plot.

JUDGES' REPORT.

Twenty Perch Plots. *Maximum Points*—154.

Society.	*Entry No.*	*Name of Holder.*	*Points awarded.*	
Warmley	113	A. Parslow ..	106	1st Prize
Filton	304	E. J. Baker ..	100	2nd Prize
Horfield	244	W. Bowden ..	93	Equal 3rd.
Bedminster	56	H. Perry	93	Equal 3rd.
Fishponds	183	C. Holbrook ..	91	4th
Ten Perch Plots.				
West Bristol ..	318	G. H. Harford ..	114	1st Prize
Horfield	285	J. T. Wall ..	108	2nd Prize
Fishponds	158	J. J. Wood ..	106	3rd
Fishponds	166	H. E. Gridley ..	95	4th
Bedminster	59	G. Parker	90	

XVI.—ANNUAL REPORT UPON THE SOCIETY'S GENERAL OPERATIONS.

By F. H. Storr.

The Annual General Meeting of Members was held on Thursday, June 2nd, in the Council Pavilion, in the Show Yard, Bristol.

The President (Lord Bledisloe, K.B.E.), occupied the Chair, and among the Members present were the Marquis of Bath, K.G., the Earl of Radnor, Lord Strachie, the Right Hon. H. Hobhouse, and Mr. R. Neville Grenville (Vice-Presidents), Sir F. H. Bathurst, Bart., D.S.O., Col. Sir R. Williams, M.P., the Rev. A. T. Boscawen, Col. R. A. Moore-Stevens, Captain W. Best, Major H. C. C. Batten, Major E. W. Farwell, Professor J. Penberthy, F.R.C.V.S., Messrs. D. Alexander, A. Allsebrook, A. Amesbury, W. Ashcroft, H. Bridgman, R. Bruford, W. H. Clark, S. E. Corbett, A. B. Criddle, J. E. Daw, E. G. Dulchen, R. A. Fox, J. Galloway, G. Gifford, J. T. Gibson, L. Griffin, V. T. Hill, E. Jones, F. H. T. Jervoise, E. Lewis, G. Lipscomb, J. D. Loveless, H. C. Marshall, G. Martyn, H. B. Napier, G. Nichols, F. G. Nurse, F. J. Parker, T. H. Pearce, W. J. H. Porter, J. F. Shelley, A. F. Somerville, T. E. Studdy, J. A. Tate, C. C. Tudway, P. C. M. Veitch, A. R. White, O.B.E., W. R. Withers, etc.

The Minutes of the last Annual General Meeting having been read and confirmed, the President moved, the Marquis of Bath seconded, and it was unanimously agreed that H.R.H. The Prince of Wales be elected President of the Society for the ensuing year.

On the motion of Mr. W. Ashcroft, seconded by Mr. H. B. Napier, the retiring President (Lord Bledisloe, K.B.E.), and Mr. D. T. Alexander were unanimously elected Vice-Presidents of the Society, and on the motion of Mr. P. C. M. Veitch, seconded by Mr. J. E. Daw, the gentlemen named on Page cxxiii of the Appendix to this Volume were elected Members of Council for the years 1921–23.

The accompanying Report, which had been adopted at a Meeting of Council held on the previous day, was then submitted to the Meeting, and on the motion of Mr. R. Neville Grenville, seconded by Mr. F. J. Parker, was approved and ordered to be printed in the Society's Journal.

The Council have especial reasons for congratulating the Society this year upon the successful opening of the Show. As the date of the Show approached, it became more and more doubtful whether the railways would be able, or would be permitted, to carry the Show traffic. Fortunately, the difficulties have been overcome; Bristol has been able to accord the Society the hearty reception which the City had prepared; and the exceptional efforts made by the Local Committee have not been wasted.

The Society desire to express their sincere thanks to the many bodies which have co-operated in the preparation of the Show. The Gloucestershire Agricultural Society and the Somerset County Agricultural Association have each contributed many local prizes in addition to a sum of £100 towards the general prize list and have, in view of the Society's visit to Bristol, suspended the holding of their Shows for the year. Your Council have, in response, conferred upon both bodies Members' privileges with respect to entries and admissions.

Bristol University, in addition to a fine exhibit, have undertaken a large amount of work in connection with the Forestry and Dairy Departments, in the latter of which Reading University College are also giving valuable help. The Bristol Education Committee and the Gloucestershire and Somerset County Education Committees have contributed an unusually good exhibit to the Nature Study Department. Mention must also be made of the large number of people who have contributed to the success of the Show in other ways.

Bristol holds Show records in many respects, and it is satisfactory to see that the entries of live stock are larger than at the last Bristol Show in 1903, while the space taken for Machinery in Motion and uncovered ground constitutes a fresh record. The programme of

Farm and Herd competitions is unusually large, and has been extended to include Small Holdings and Allotments. A special feature is exhibits from our Overseas Dominions, many of the Colonial Governments being represented, and their stands occupy prominent positions in the Show Yard. The practical demonstrations given in the Show Yard have been enlarged, and now include "Clean Milk Production," "the Conversion and Utilization of English Timber," "the Art and Science of Farriery" as well as Grafting, Pruning, etc.

The Society have sustained several losses among old and valued members during the past year. The Father of the Council, Mr. J. D. Allen, a vice-president, died in December last, after 53 years connection with the Council of the Society, which he had so consistently supported. Lord Digby, a former President and Vice-President of the Society, has also passed away.

Your Council are glad to report that the Society has received exceptional support during the past year. Sixteen Governors and 306 Members have been elected since the last Annual Meeting, and the Membership of the Society now stands at 1,257. The Council have been fully alive to the need of maintaining the Society's record as a pioneer in Agricultural education and research. Having in view the urgency of improving the yield from pasture land, which constitutes a large proportion of the agricultural land in Great Britain, they have voted a sum of £200 to be devoted to demonstrations of the value of the eradication of bracken and thorn from poor pastures, and the application of suitable manures. Plots have been found in Somerset, Gloucestershire, Devon, Hampshire and Wilts; local stewards have been appointed, and work will be commenced on them during June. The thanks of the Society are due to the Bristol University Research Staff for undertaking analysis and other work in this connection.

Further, in order to develop the instructional side of the Annual Show, the President has arranged for an address to be delivered on each day of the Show on matters of immediate interest. It has been decided to print these lectures in pamphlet form, and it is hoped that they will be widely circulated. Special attention has been paid to the Forestry demonstrations, which, besides fruit culture, will cover the uses of English timber; while the help of several Government and University institutions has been secured in illustrating the scientific advances recently made in various departments of Agriculture.

Many questions of importance to Agriculture have come up for consideration during the year. Your Council supported the action of other Agricultural Societies in protesting against the imposition of an Entertainments Tax on Agricultural Shows. Legal opinion was obtained to the effect that the Government were entitled by law to collect the tax in these cases. A deputation to the Chancellor of the Exchequer made it quite clear that no relief could be expected from the tax, and the matter has had to be left in this position.

Your Council considered it important that the Diseases of Animals Act Amendment Bill should become law as soon as possible, and a resolution to this effect was forwarded to the Ministers concerned and to Members of Parliament, who were also Members of the Society. The urgency of this measure was emphasised by the agitation for the removal of the embargo on the importation of store cattle, which has led to the appointment of a Royal Commission to consider the question. The Council have sent representatives to conferences organised by the Central Chamber of Agriculture, and have decided to support that body in organising the evidence to be given before the Royal Commission on behalf of British agricultural interests.

The Council also supported the Gloucestershire County Council in urging the Government to make provision for prohibiting the sending to a Bull, for service, of a Cow which, to the owner's knowledge had within two months previously, prematurely calved.

During the year, the Council have re-nominated Mr. H. B. Napier as the Society's Representative on the Governing Body of the Bristol University Agricultural Research Station at Long Ashton, whose staff has been greatly increased, and whose scope and area of experimental work has been extended. The Agricultural Research Committee of Bristol University has in turn elected the President of the Society, Lord Bledisloe, as its Chairman, in place of the Right Hon. H. Hobhouse. Mr. W. Ashcroft has also been elected on the Governing Body of the South-Eastern Agricultural College at Wye. The Council have continued the grant of £100 to the National Fruit and Cider Institute. The President of the Society has, at the request of the Lawes Agricultural Trust, consented to act as Chairman of the Governing Body of the Rothamsted Experimental Station, the oldest Agricultural Research Station in the kingdom.

The Council have much pleasure in stating that they have accepted cordial invitations from Plymouth and from Swansea, to hold their 1922 and 1923 Meetings respectively in those places. H.R.H. The Prince of Wales has graciously consented to be nominated as President for the ensuing year, and the Council have great pleasure in recommending H.R.H. for election. They also recommend that the retiring President and Mr. D. T. Alexander be elected Vice-Presidents of the Society, and that the gentlemen named on the Agenda paper be elected as Members of Council for the years 1921-1923.

Your Council would desire to tender to the Rt. Hon. the Lord Bledisloe their thanks for his services as President during the past year, during which he has not only taken the most active interests in all the Society's work, but has also acted as the Society's Representative on many important occasions. They would also wish to express their deep appreciation of the generous and invaluable support given to the Society by the Bristol Local Committee, and of the help of all those who have contributed to the Prize List and to the success of the Bristol Show.

Votes of thanks were then passed to the Lord Mayor of Bristol and the Local Committee, and to the Great Western Railway Company, for their efforts to promote the success of the Meeting; to the Gloucestershire Agricultural Society, and the Somerset County Agricultural Association for their cordial co-operation ; to those gentlemen who had kindly acted as Judges in the several Departments, and to Lord Bledisloe for the valuable services he had rendered to the Society as its President.

Lord Strachie moved, in accordance with notice, that General Law XXIII be rescinded. After a discussion, the following amendment was moved by Mr. Hobhouse, seconded by Mr. R. Neville Grenville, and agreed to : " That it be an instruction to the Council to frame a new General Law to take the place of General Law, No. 23, which, while excluding all questions of general or party politics, shall not debar the Council from discussing or taking action on important questions of general agricultural interest."

The amendment was put to the Meeting and carried unanimously.

XVII.—THE NATIONAL FRUIT AND CIDER INSTITUTE.

By B. T. P. Barker, M.A., Director.

In contradistinction from the year 1920, which was marked by considerable development of the Institute both as regards staff and plantations, 1921 has relatively little to show in those directions. The necessity for strict economy during the present period of general financial difficulty has applied to research stations as elsewhere; as a result the chief problem during the year has been the maintainance of work already in hand without exceeding income rather than the continued development of the Station. Making allowance for inevitable minor capital expenditure this has been fairly well accomplished, although progress in certain lines of work has been slowed down in consequence.

A further marked increase in the volume of Advisory work dealt with has to be recorded, and the effects of this on the research activities is indicated below. While existing conditions continue the Station cannot undertake an increased amount of outside work.

A novel departure from the normal work of the Station resulted from the holding of the Imperial Fruit Show at the Crystal Palace last autumn. In order to illustrate as completely as possible the various uses of the apple the Ministry of Agriculture, in conjunction with the "Daily Mail" authorities, decided to arrange for demonstrations of cider-making to be given daily throughout the Show. After negotiations with the National Association of Cidermakers the Institute undertook the whole responsibility for the demonstrations, the former body bearing the expense involved. Great interest was aroused by them among visitors to the Show and it is unquestionable that the cider industry has already derived material benefit.

Staff.—The only Staff changes to be recorded for the year are the additions caused by the arrival of Mr. F. Summers, D.S.O., M.C., M.Sc., Plant Physiologist to the Station, and Mr. W. H. Neild, Experiments Officer and Recorder, to take up their appointments, which were announced in last year's Report.

For the first half of the year Miss Scott and Miss Watson, of the technical members of the Campden Experimental Factory Staff, were stationed at Long Ashton to investigate certain problems of fruit preservation, in collaboration with Mr. Grove.

During the summer Mr. Wiltshire was absent from the Station for several weeks, during which he made a tour through Holland and Belgium and subsequently visited Paris, to study the phytopathological work in progress in those places. The cost of the tour was met by the award of a Travelling Fellowship by the Ministry of Agriculture and Fisheries.

Land and Plantations.—Since the considerable extension of the fruit plantations recorded in last year's Report, development work in this direction has been restricted. This policy has been deliberately adopted on account of the necessity of limiting expenditure during the present period of financial difficulty. A few small plot experiments have been started and the establishment of a new cider and perry orchard is being proceeded with gradually; otherwise little is being done towards the formation of new plantations beyond the continued preparation of land taken in hand a year ago.

Buildings.—For financial reasons also it has not been possible to undertake the provision of additional buildings, which are much needed. The most urgent case, that of a house for pot culture experiments, has been met by an improvised temporary structure, which is neither large enough for requirements nor suitable for the conduct of the work under efficient conditions.

General.—The chief development of the year has been the arrangement for the transfer of the Campden Experimental Factory for Fruit and Vegetable Preservation to Bristol University, under which operations there in future will be directed from Long Ashton, and constitute an extension of the work of the latter. Hitherto the factory has been conducted directly on behalf of the Ministry of Agriculture and Fisheries by a Committee appointed by the Ministry, aided by grants from the Development Fund.

In presenting the following Report on the research work for the year, reference must be made to the very serious effect on the research activities of the Station, caused by the increase in the calls on the time of the Staff resulting from the rapid development of the Advisory side of its work since the termination of the war. Applications for help and advice come mainly from those directly engaged in the industries which the Station is designed to assist by research and it is therefore not only difficult but frequently impolitic to refuse to give help where it could be rendered. On the other hand an enquiry of that kind generally involves immediate attention if it is to be effective; consequently, research in hand at the time inevitably suffers, in some cases irretrievably for the season. The situation which arises from the lack of assistant staff in the various branches of science with which the Station is concerned threatens to disorganise research to a most serious extent; it is difficult to see a satisfactory remedy if additional staff appointments are not sanctioned.

ADVISORY WORK.

The number of enquiries received during the year ending September, 30th, 1921, was 371, thus showing an increase of 80 over last year. The figures for the counties as well as totals and the corresponding figures for previous years are set out as below :—

	Year ending September 30th.				
	1917.	1918.	1919.	1920.	1921.
Gloucester (including Bristol) ..	24	21	29	53	73
Hereford	6	2	6	10	22
Somerset	52	46	75	79	96
Wiltshire	4	0	6	3	10
Worcester	16	11	11	29	45
Other areas	31	93	75	117	125
	133	173	202	291	371

The figures for " other areas " include Devon and Monmouth, which counties contribute an annual grant to the Institute. Last year the enquiries received from the Ministry of Agriculture's Experimental Station on Fruit and Vegetable Preservation at Campden were included in the totals for " other areas," but this year they have been omitted.

NATURE OF ENQUIRIES.

Fruit Products.—Under this head 80 replies were given. The geographical field from which the enquiries came was wide, only 25 coming from the Advisory area. Most of the subjects could be grouped under such general headings as Conposition of Fruits; Fermentation of Fruits; Cider Making in general; Cider Making Machinery; Yeasts; Vinegars. Enquiries outside this country were received from Isle of Jersey, Ireland, France, Belgium, Australia and India. Two special visits were made to orchards in conjunction with the county horticultural instructor, in connection with suitable cider varieties.

Enquiries relating to methods of fruit and vegetable preservation were also received, but are not included in the above statistics, having been dealt with as a separate part of the work of the Station in conjunction with the Experimental Factory in Fruit and Vegetable Preservation at Chipping Campden.

Mycological.—The number of enquiries received during the past twelve months are as follows :—

Somerset	27
Gloucester	25
Worcester	14
Hereford	5
Wilts	4
Outside areas	12
	87

The enquiries received dealt with a large variety of plant diseases, some of them very obscure, whilst others were well known. Silver Leaf formed the subject of seven enquiries, dealing usually with particular points of this disease. Many enquiries were received on other diseases showing that these were fairly well distributed.

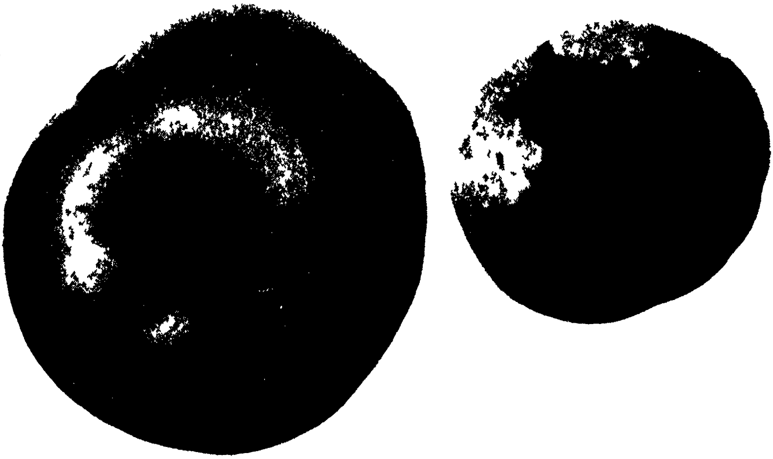
A feature of the year was the occurrence of a disease on raspberries, which was reported from Somerset and from Worcestershire. The symptoms of the disease were chiefly evident in the Spring season and consisted in the failure of the buds to open out, especially those towards the top of the canes, and the dying back of the canes. New shoots grew up from the ground during the summer and produced canes which, although somewhat shorter than usual on account of the dry weather, were quite healthy. The trouble was sometimes associated with an attack of the raspberry moth, but the latter insect was insufficient to account for the whole of the damage. No fungus has been found in the dead buds or in the stem, the tissues of which appeared to be quite healthy. So far as the present evidence goes, therefore, one is inclined to suspect climatic factors. But it is not possible on the data at present available to assign any definite reason for the trouble, and this subject requires fuller and more detailed research.

Another interesting disease encountered was a Fusarium parasite of carnations. This disease is apparently not uncommon in carnation beds, the symptoms being a wilt and subsequent death of a branch, or even of the whole plant. It has been reported from from South Africa and British East Africa, but appears to be known also in England.

One case occurred of Crown Gall on loganberries, a rather uncommon occurrence. Brown Rot (*Sclerotinia fructigena*) was found on peaches growing out-doors. One instance of cherry disease, where the leaves showed sudden browning, followed by death, was encountered. The browning was frequently seen to start near the mid-rib. No fungus or bacterial organism could be found in the affected material, and whilst bacterial activity could not be ruled out altogether, the available evidence pointed to the disease not being due to any parasitic organism.

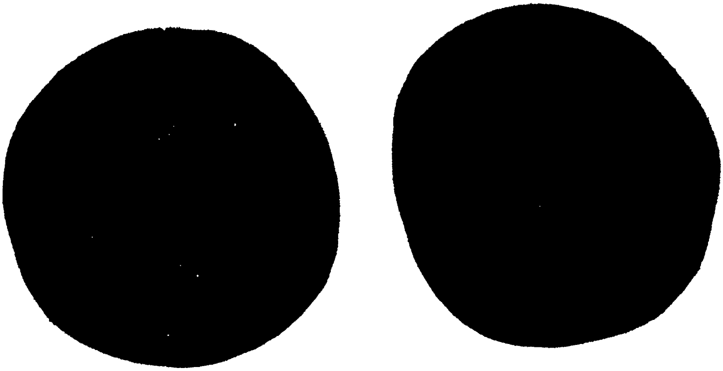
A non-parasitic disease of apple fruits, recently labelled "apical browning" was very abundant during this season. Stirling Castle was the most susceptible of all varieties, Bramley coming next, whilst other varieties only occasionally showed the disease. The first damage occurred very early in the season and early symptoms frequently showed when the fruits were about half an inch in diameter. The first signs of the disease appeared to be a splitting

Fig. 2.



Apical Browning

Fig. 3



Late Apical Browning

of the epidermal tissue close to the calyx. This splitting continued throughout the season, probably on account of the continuous swelling of the fruit, so that finally large scars were formed round the apical end of the fruit, which disfigured it very much. The scars, however, were always confined to the outer layers of the fruit, and, therefore, the chief damage consisted in the unsightly appearance it produced. On the Continent the opinion is held that the damage is due to frost-action, but in England the regularity of its appearance on Stirling Castle rather detracts from this view. It is noticeable that the scars only form in fruits with short cores, and it would appear possible that this characteristic construction sets up strains in the swelling fruits which give way at the weakest point, viz., just outside the calyx.

Another type of "apical browning," which may, perhaps, be dintinguished by the term "late apical browning," occurred on Bramleys at the Research Station, and was also found in a number of cases of Bramleys exhibited at the Imperial Fruit Show. This affection only made its appearance in August and September, and consisted of a browning of the tissue from the disc of the fruit for some little distance into the flesh of the apple just beneath the surface. Plate cultures were made, using as inoculant material from the browned portion of the fruit. No organism could be distinguished in such browned portions, and it is probable, therefore, that the browning is non-parasitic. It is noteworthy that the Bramley is the variety affected, and it may be that the growth strains caused by the swelling of the fruit, result in this case in the splitting of the tissues at the disc. A great lengthening of the tissue between the stamens and calyx during the growth of the fruit is evident from cutting fruits vertically through the core. The core of Bramleys, as mentioned above, remains very short, and hence any sudden increase in the rate of growth occasioned, perhaps, by heavy rainfall after drought, might well cause ruptures such as described.

Pomological.—Under this head 41 replies were given by letter. In addition, at least another 20 were furnished verbally. Owing to the good apple year and the large number of trees which bore a crop this year, many owners were anxious to obtain identification of trees which in other years probably failed to set crops. Such trees generally belong to private persons, and are thus frequently out of the way kinds or even seedlings. The identification of such varieties is often very laborious and occupies much time. One consignment occupied two days before every apple could be identified.

Shows.—An exhibit from the Station was sent to the following Shows :—

(1) The West Midland Show, at Worcester.
(2) The Bath and West, at Bristol.
(3) The Pershore Fruit Growers' Association, at Pershore.

The following sections dealing with the Advisory Work in Agricultural Chemistry and Economic Entomology have been contributed respectively by Mr. T. Wallace and Mr. A. H. Lees, the advisers in those subjects.

AGRICULTURAL CHEMISTRY.

During the year 56 requests for advice have been dealt with. The sources and nature of these enquiries, together with any special points of interest with reference to them, are given below.

SOURCES OF ENQUIRIES :—

Gloucester (including Bristol)	14
Hereford	3
Somerset	23
Wiltshire	3
Worcester	11
Counties outside the Bristol Province	6
Total	60

NATURE OF ENQUIRIES :—

1.—SOIL PROBLEMS.

(*a*) *Soil Manurial Enquiries.*

Pastures and Meadows	5
Arable Soils	15
Fruit Soils	14
Garden Soils	5
Total	39

(*b*) *Miscellaneous Soil Problems.*

Soil conditions in cases of "Leaf Scorch"	4
„ „ „ disease of Michaelmas Daisies	1
„ „ „ cases of Finger and Toe disease	2
„ „ „ „ „ Total failure of crops	10
„ „ „ case of "Stripe" in Sweet Peas	1
Suitability of soils for Apple growing	6
„ „ „ strawberry growing	2
„ „ „ wheat growing	1
Use of phenol and cresylic acid for soil sterilisation	1
Total	28

2.—MISCELLANEOUS ENQUIRIES.

Manurial value of sample of chrome leather clippings	1
,, ,, ,, ,, ,, scutch	1
,, ,, ,, ,, ,, waste hair	1
,, ,, ,, ,, ,, lime material containing sodium sulphide	1
,, ,, ,, ,, ,, mineral deposit from Carboniferous Limestone Formation	1
,, ,, ,, basic superphosphate	1
,, ,, ,, waste "blood and bone" material ..	1
,, ,, ,, lime and limestone	9
,, ,, ,, shoddy	2
Potash content of sample of burnt paper ash	1
Total	19

OBSERVATIONS ON ENQUIRIES.

1.—*Soil Enquiries.*—In dealing with these enquiries, 15 farms —other than those visited on Pershore tour—have been visited, and 72 samples of soil have been examined. In most cases where enquiries have been sent in relating to poor crops or total failures of crops, the soils in question have been found to be acid in re-action. Thus of the 10 cases of total failures of crops investigated, eight of the soils contained no lime and had considerable " lime requirements." Thus the necessity of farmers having their soils tested for lime is again demonstrated.

Other points worthy of note are the increasing number of enquiries *re* the manuring of fruit soils, the number of enquiries *re* the suitability of land for apple-growing, and the number of enquiries *re* " Leaf Scorch."

Investigations are now in progress on these three subjects of enquiry, and are furnishing much useful information.

2.—*Miscellaneous Enquiries.*—The whole of these enquiries have related to materials of probable manurial value, and it is interesting to see that farmers are beginning to recognise that many forms of waste material may have some manurial value.

Most of the samples of lime and limestone submitted for examination were articles which farmers had been offered at comparatively low prices, and while some of the samples were well worth purchasing, others were poor and the prices asked for them too high.

From the nature of the enquiries about lime it is evident that the price of high grade lime is higher than most farmers are able to pay.

As so much land at the present time is in need of lime and as liming is so costly, there is no doubt that it would be well worth while advisers giving a considerable amount of time to the problems of " liming of soils," and to exploring cheap sources of lime.

SPECIAL INVESTIGATIONS AND WORK UNDERTAKEN IN AN ADVISORY CAPACITY.

(1) Field Experiments on "The Eradication of Bracken from poor Moorland Pastures."

These experiments are being carried out in conjunction with the Experiments Committee of the Bath and West and Southern Counties Agricultural Society. Experimental plots have been started in various parts of the South-West of England; on which the comparative effects of cutting bracken at various times during the season with a view to its extermination are being studied. The experiments are to be continued over three years. The soils of the experimental plots have been analysed in this laboratory. The relative values of pure Nauru Phosphate and high grade Basic Slag for effecting improvement in the herbage of these plots are being compared.

(2) Experiments to ascertain the cause of the dying off of strawberry plants in the Tamar Valley.

These experiments are being carried out in conjunction with other members of the Research Station Staff.

(3) Experiments on Chlorosis with reference to a case at Wincanton, Somerset.

Further experiments have been carried out on tomato plants during the season 1921, but the results of the series are not yet complete. It is hoped that these will be completed during the season 1922. after which a full report will be made on the work done.

(4) Manurial value of certain Radio Active Residues.

Pot experiments have been carried out to test the manurial value of the residues on the growth of mustard and peas. It has not been possible to obtain the dry weights of the crops in time for insertion in this report.

(5) Agricultural Education Association Experiments on the relative values of various phosphatic manures in improving poor pastures.

The soils of the experimental plots situated in Somerset are being analysed in this laboratory.

(6) Liming experiments on acid soils.

Experimental plots have been started at the Research Station to investigate the meaning of the "lime requirement" figures obtained by the Hutchinson-McClennan Method on a definite soil type. The method of experiment adopted is to determine the lime requirements of various acid plots of the same soil type and to apply various amounts of lime to these and to note the effect of these dressings on the "lime requirement" figures obtained at yearly intervals. It is proposed to carry out experiments along these lines as opportunities occur on the various soil types in the Bristol Province.

ECONOMIC ENTOMOLOGY.

The subjects dealt with were as follows :—

Insects	53
Sprays	12
Diseases	13
Fruit Questions	14
Miscellaneous	1

Under the heading "Insects" all other economic groups, such as Myriapoda, Arachnida and Mollusca are included. Among the more interesting fruit insects may be mentioned the Plum and Cherry Borer (*Semasia woeberiana*), and the Raspberry Gall Fly (*Lasioptera rubi*), both sent in from Somerset.

From Worcestershire a request was sent in for identification of a soil insect among newly planted strawberries. This proved to be Leather Jackets that were present in thousands, eating first the leaves, and. finally, the whole plant. Subsequent enquiry showed that the field had been under grass recently. Advice given was to roll the soil as firmly as possible (in this case by means of cart wheels) and then to secure a dust tilth of about two inches. This method has given excellent results in field practice. The case is important since it is obvious that such conditions may occur whenever new strawberry plantations are put down on recently ploughed grass land. So far no information is to hand as to the success of the method in this particular case. Several enquiries were sent in respect of surface caterpillars attacking turnips and swedes. In most cases it was too late to take any active steps. These caterpillars have evidently been widespread this year, and a large acreage has been damaged.

"Diseases" indicates maladies other than those caused by fungi and insect pests. Of these enquiries 10 concerned Reversion Disease of Black Currants, specimens being frequently sent in for identification and advice.

"Fruit Questions" were largely concerned with the subjects of Lorette pruning and of ringing. It is evident that growers are taking an increasing interest in the possibilities of Lorette's system of pruning, and some have already started the treatment on their own plantations. Their results are already sufficiently promising to ensure the system being given a fairly extensive trial in the next 10 years. The operation of " ringing " has also been the subject of considerable enquiry, both verbal and through the post.

The number of enquiries has shown an increase of 33 per cent. on last year's figures. This figure does not probably do full justice to the amount of advice asked for, since much is given by word of mouth on various occasions, such as Growers' Meetings, the Field Day of the Research Institute, at Shows, and in the course of ordinary visits to growers' plantations. There is no doubt that the call for advice is increasing rapidly as the grower realises the value of the research work that is being done. There is every likelihood of this call for advice increasing in intensity, and in the near future of still further encroaching on the time at present available for research.

VISITS.

Pershore.—The Pershore Market Gardeners' and Fruit Growers' Association expressed a desire for a visit of Advisory Officers on two occasions. Mr. Wallace and I accordingly spent several days in the Pershore district in November, 1920, and Mr. Wiltshire and I in the Spring of 1921. The visits revealed certain problems, some of a mycological, some of an entomological, but most of them of a pomological nature.

Cox's Orange Pippin not Fruiting.—Of this there were two cases. The first was an arable orchard containing 15-year-old Cox bushes on paradise stock. There were also present as pollenisers, James Grieve and Worcesters. The orchard went down to rough grass during the war, and was in that condition at the time of visiting. There was a certain amount of Psylla eggs on the trees, but not a large number. The Cox Orange Pippin flowered abundantly and there were plenty of bees about. Occasionally branches, and occasional trees would set fruit, but a full crop was never obtained. Cox on free-stock in grass in a neighbouring orchard fruit well. The reason for non-setting could not be due to lack of polleniser or bees, because these were present, nor to the grass, because no set was obtained years ago when the culture was clean. It could not be due to Psylla, as there was not sufficient eggs present to account for damage to bloom. Nor could it be due to frost, as the other varieties set satisfactorily. A further search revealed the fact that the spurs were all weak and mostly three-leafed. It appeared, therefore, that the failure was due to lack of food.

Investigations by Mr. Wallace showed that the soil was heavy (Lower Lias), and had a slightly acid re-action. The trouble was attributed by him tentatively to lack of nitrates in the soil. Experiments have been suggested by him to test the effect of dressings of lime and nitrogenous manures.

A second case of Cox Orange Pippin not fruiting properly was also met with in the same district. Here again the circumstances were very similar, and nitrogenous manures were advised. The trees have improved in general appearance under the treatment and may show results in fruiting next year.

In a third case, Cox was one of several varieties that did not fruit as expected and desired. These trees were next to Beauty of Bath. Plenty of spurs were present, but they were all weak. Mr. Wallace reports that this soil was a very heavy one, containing a high percentage of clay and a large supply of lime, but that phosphates were deficient. It is probable that they require heavy dressings of nitrogenous and phosphatic manures.

These three cases have all this feature in common—that apples were flowering abundantly, but not fruiting, though every conceivable need is supplied, except, possibly, the manurial one. Observation and evidence lead me to think that this limiting factor is a comparatively common and usually unrecognised one in plantations where trees have attained 10 to 15 years of age.

The Poor Fruiting of Rivers' Early Prolific Plum.—This plum, despite its name, is not prolific in Worcestershire. Roughly speaking it gives a good crop once in seven years, a poor to medium twice in seven years, and practically no crop at all in the other four years. A case of this kind was advanced by one grower, who stated that his trees now 25 years old, fruited but poorly. He further stated that cut back bushes would fruit though fairly young ones, uncut back, do not. These facts appear to indicate that these trees are suffering from nitrogen shortage (even though good fruiters, such as Pershore Plum, would set under these conditions). Mr. Wallace has suggested to this grower experiments with nitrogenous dressings.

Black Currant Culture.—Though this fruit is not abundantly grown, in most cases where it is grown the stocks were distinctly, sometimes very much, affected with Big Bud. Reversion was also correspondingly present. Seabrook's Black is more susceptible to Big Bud than in East Anglia, though, probably, not so much so as at Long Ashton. The importance of obtaining clean stocks did not seem to be sufficiently realised.

Leaf Scorch of Apples.—One plantation visited on the "Drift" soil of the district was suffering from a rather severe case of leaf scorch. Mr. Wallace reports that an examination of other fruit plantations on this deposit has shown that the disease is present on apple trees in all these plantations. The cause of the scorching on this soil is being studied in the investigation on Leaf Scorch now in progress at Long Ashton. Analysis shows that the soil is of a very coarse texture, containing a high percentage of gravel and sand and is deficient in potash. The effect of applying a dressing of potash to the soil is being tried.

Newnham-on-Severn.—An application to demonstrate Lorette's pruning was made by a grower in this region. The demonstration was given, and after half an hour of theoretical and practical instruction some 10 or so of his pupils were able to do the necessary work quite efficiently. The method is, therefore, easily taught to persons of intelligence.

A visit to a neighbouring plantation showed Pershore Plums doing badly, though Warwickshire Hangdowns were making good growth. Many of the spurs on the Pershores were dying, and the trees looked unhealthy. The soil was distinctly acid and the trees were, therefore, probably short of nitrogen (as their appearance led me to believe). The weaker growing Pershore showed the effects far more than the stronger growing Hangdown.

Street, Somerset.—A visit was made to this district with Mr. Turner, Horticultural Instructor for the County, for the purpose of giving advice on pruning and matters of general importance in fruit culture. The district is a striking one from the fruit point of view in that apples are making good but short and sturdy growth on a heavy Lias soil in a wet district. In the same rainfall and a lighter soil at Long Ashton, this short sturdy growth cannot be obtained. One striking point about soil conditions in the Street district was the presence of Lias Limestone about four feet below the surface. It is at least probable that the presence of this stone has a growth-limiting action in summer which opposes the usual growth-hastening action of the high rainfall. There are at present only a few growers in this district, but in my opinion it is one where apple growing should succeed in bush form.

POT EXPERIMENTS ON THE MANURING OF FRUIT CROPS.

(T. Wallace.)

A large number of field experiments on the manuring of fruit crops have been carried out in America, but very few have been carried out in this country. Of these latter experiments, those of Pickering, at Woburn, and of Dyer and Shrivell in Kent, constitute the most complete series.

All workers on this subject have recognised that the problem is vastly different from and much more complex than the problem of the manuring of farm crops, and as there is already a considerable literature on the possible effects which manures may produce on fruit trees, it is not proposed to add to this in this paper.

The point which is brought out most strongly in comparing the results obtained in previous experiments is that the results show no agreement among themselves, especially in the experiments on the manuring of apple trees.

The results obtained in America on apple trees may be summarised as follows :—

In cultivated orchards, sometimes no result whatever has been produced on the trees as the result of applying fertilisers; sometimes an increased growth of the trees has resulted without any increase in the yield of fruit being obtained, and occasionally the quantity of fruit obtained has been increased to such an extent as to make the application of manures a paying proposition. In grass orchards remarkable increases in crops have been obtained in some cases by the application of quick-acting nitrogenous manures, such as nitrate of soda.

In this country, the results obtained at the various centres on the various fruit crops show little agreement. Pickering obtained entirely contradictory results on apple trees on the two types of soil at Woburn. On one soil type he found that the application of manures produced no effect on the trees, whilst on the second type the trees appeared to re-act normally to the manures.

With bush fruits—gooseberries and currants—the crops were greatly increased by applications of dung on both types of soil, but differing results were obtained from the use of artificial manures on the two soils.

Only small crop increases were obtained by the application of manures to strawberries, but it was thought that the soil was unsuitable for this crop.

Dyer and Shrivell obtained positive effects from various schemes of manuring on different types of fruit crops and ventured to make tentative recommendations for the manuring of some of these.

In view of the facts that the great majority of the leading fruit growers of this country spend large sums of money on manures annually, and that the results of previous experiments on the manuring of fruit crops have been so contradictory and inconclusive, it appeared desirable to carry out experiments at this Station to attempt to determine the effects of various manurial treatments on the various fruit crops.

It was felt that before proceeding with field experiments, it was desirable to carry out experiments more of the laboratory type in order that the various effects produced could be studied in greater detail, and in order that the trees, bushes or plants under experiment could be kept more easily under controlled conditions and certain factors entering into field experiments eliminated.

GENERAL PLAN OF EXPERIMENT.

With this idea in mind, it was decided to attempt to carry out very simple series of manurial experiments on the following lines. Apple trees, gooseberry and currant bushes, and strawberry plants were to be grown in silver sand contained in unglazed pots, which had been waxed previously to render them more impervious to water, and in each case the effects of feeding the trees, bushes or plants in question with various nutrient solutions were to be studied. In each case the scheme of feeding was to be as follows:—

Series A.—Fed with a complete nutrient solution.
,, B.— ,, ,, ,, ,, ,, ,, but an extra amount of Sodium Sulphate to be given.
,, C.—Nitrogen to be omitted from the complete nutrient solution.
,, D.—Potash ,, ,, ,, ,, ,, ,, ,,
,, E.—Phosphoric Acid ,, ,, ,, ,, ,, ,,
,, F.—Calcium to be omitted ,, ,, ,, ,, ,, ,,
,, G.—Magnesium ,, ,, ,, ,, ,, ,,
,, H.—Rain Water only to be given.

The composition of the complete nutrient solution which was to be used is given below, and the other solutions were to be formed from this by substituting soda for any base to be omitted, and the sulphate radical where an acid radical was to be omitted. Series B was to be included as the scheme above entailed the introduction of amounts of soda and sulphate radicals into the various solutions in excess of the quantity present in the complete nutrient solution. Rain water was to be used in making up all the nutrient solutions as it was felt that very large quantities of water would be necessary, to carry out this work.

COMPOSITION OF THE COMPLETE NUTRIENT SOLUTION.

Sodium Nitrate	5·0 gms.
Potassium Nitrate	2·0 ,,
Potassium di-hydrogen phosphate	1·0 ,,
Calcium Sulphate	1·0 ,,
Magnesium Sulphate	1·0 ,,
Sodium Chloride	1·0 ,,
Ferric Chloride	0·4 ,,
Rain Water	To 1 litre.

1 litre of solution to be diluted with 9 litres of rain water previous to application.

Experimental.—Experiments on these lines were commenced on apple trees and strawberry plants during the winter 1920–1921, in order to test the method of experiment and to gain some preliminary knowledge as to how the trees and plants were likely to re-act under the treatments.

As the result of one season's work, many interesting points have been brought out, and it has been decided to extend the work to gooseberries and black currants during 1922. Fresh series on apples and strawberries are also to be commenced then.

Although the experiments on the apples and strawberries have only been in progress over one season, certain results, which must be regarded as purely qualitative at this point, have been obtained, which it appears desirable to put on record even at this early stage of the investigation. The results recorded are not to be regarded as being of a final character, and it is probable that as the experiments proceed over the successive seasons many of the differences observed at this stage will be modified, whilst it is obvious that in the case of apple trees the results of the first season must be influenced to a certain extent by the reserves of food material previously stored up in the tree. It is intended to publish further progress reports on the experiments during the next few seasons, and attention will be drawn in these to any marked changes which the trees and plants undergo as the experiment progresses.

A detailed account of the experimental work carried out and of the observations made during the season of 1921 is given below.

Weather during Season 1921.—The season was one of the hottest and driest on record. Temperatures between 80°F.–89°F. in the shade were quite frequent, especially during July, in which month 10 readings of over 80°F. were recorded. Only 6.68 inches of rain fell from March 1st–July 31st. The rainfall from this latter date to the end of the growing season was light. The first late season frost was recorded on October 24th.

EXPERIMENT ON APPLE TREES.

Forty trees—variety Cox's Orange Pippin, said to be on broad-leaved Paradise stock—are being used in this experiment. They were divided into eight series, each of which consisted of five trees. The series were lettered from A to H, and the trees of these series were fed with the respective nutrient solutions as described for the series on page 156.

The pots used in this experiment are 10in. plant pots. Previous to their being used, they were dipped in molten paraffin wax and the holes at the bottoms were covered with fine copper gauze to prevent the sand from running through. Ten kilograms of dry silver sand are used in each pot.

The method of feeding the trees throughout the season has been to maintain the moisture contents of the sand between 16%–20% of the weight of the sand in the pots by means of the respective nutrient solutions.

The sand in each pot has been leached through fortnightly with rain water to prevent the accumulation of salts or toxins in it.

The tops of the pots are covered with pieces of tarpaulin to protect the contents from rain, etc., and to prevent excessive surface evaporation.

Planting.—All the trees were planted on February 25th, 1921. Previous to planting, the roots of all the trees were treated in the Springfellow method, *i.e.*, all laterals were removed and only the "carrot stump" left. All the trees received a normal winter pruning after planting.

Position of trees.—From the time of planting until 1st October, 1921, the trees stood in the open. They were prevented from being blown about by the wind by tying each to a strand of wire stretched between wooden uprights. In order to protect the pots from frost damage they were removed on October 1st to a glass-roofed shed with open sides.

Observations made during the season.—Observations were made on the following points :—

(*a*) Times of opening of buds.
(*b*) Types of foliage produced.
(*c*) Times of the falling of the leaves.
(*d*) Lengths and types of shoot growth made.
(*e*) Types of root systems made.

Note.—All blossom produced was removed at an early stage.

(*a*) *Times of opening of buds.*—The only point of note was that the buds of one tree of each of the series, with the exception of Series F, were later than the buds of the remainder of the trees in bursting into leaf. The leaves of these trees up to the middle of July were much smaller than those of the other trees, and it appeared as though the trees in question had experienced some difficulty in becoming established in the sand. On examining the root systems of the trees on December 10th, 1921, it was found that the roots of these latter trees were of the free stock type, whilst those of all the others were of the Paradise stock type.

(*b*) *Types of foliage produced.*—Some very interesting observations have been made on the types of foliage carried by the trees of the different series throughout the season and it was obvious from these observations that the different manurial treatments were producing effects within the trees from quite an early date in the season. By the end of June, there were marked differences to be seen in the characters of the leaves. A detailed examination of the foliage was made on July 6th, and an account of the observations made on this occasion is given below.

Note.—In the detailed descriptions which follow on the types of foliage types of root systems, etc., the trees are given definite serial numbers, *e.g.*, Series A., 1, 2, 3, 4, 5. Series B., 1, 2, 3, 4, 5, etc.

Series A.

Nos. 1, 4, showed no leaf scorch.

No. 2.—A small amount of leaf scorch was present at the tips of the leaves.

No. 3.—Showed a medium amount of leaf scorch at the tips and along the margins of the leaves.

No. 5.—The leaves were badly affected with marginal leaf scorch.

Some of the leaves of Nos. 2, 3, 4, were turning yellow. The leaves of No. 1 were still very small. Throughout this series, the leaves were generally well developed in size and were dark green in colour.

Series B.

No. 1 showed no leaf scorch, and the leaves were small, as in A 1.

Nos. 2, 3, 4.—There was a fair amount of tip scorch present.

No. 5.—The leaves were affected with leaf scorch to a similar extent, as in A 5.

The leaves of the trees in this series were very similar to those of the trees in Series A in colour, size, and the amount of leaf scorch present. Some of the leaves were turning yellow.

Series C.

There was no leaf scorch present on any of the trees.

The leaves of the trees of this series were similar in size to those in Series A, but were lighter green in colour.

Series D.

No. 1 showed no leaf scorch. The leaves were small, as in A 1.

Nos. 2, 3, 4, 5.—The leaves of all these trees were badly affected with leaf scorch.

The leaves of the trees of this series, previous to their becoming badly scorched, were similar in size and colour to those of the trees in Series A, and had shown no signs of being in any way abnormal.

Series E.

No. 1.—There was no leaf scorch present. The leaves were small as in A.1.

Nos. 2, 4, 5.—There was no leaf scorch showing.

No. 3.—The leaves were slightly affected with leaf scorch at the tips.

The leaves of the trees in this series appeared to be somewhat smaller than those of Series A, and were slightly lighter green in colour.

Some of the leaves of Nos. 2, 3, 4, 5, were turning slightly yellow.

Series F.

Nos. 2, 3, 4.—There was no leaf scorch present on these trees.

Nos. 1, 5.—The leaves showed a little leaf scorch at the tips.

The leaves of the trees of this series were generally large and well developed, and their colour was practically normal. Nos. 1, 5, showed considerable yellowing of the leaves.

Series G.

A small amount of leaf scorch, mostly at the tips of the leaves, was showing on all the trees of this series.

The leaves of these trees were identical in appearance to those of Series A.

The leaves of No. 1 were smaller than those of the other trees of this series. Nos. 1, 2, 3, showed slight yellowing of the leaves.

Series H.

The leaves of the trees of this series were similar to those of Series C, being of normal size, light green in colour and showing no leaf scorch.

Summary of observations.

1.—The leaves in Series E appeared to be slightly below the size of those in the other series.

2.—The leaves in Series C, E, H, were lighter in colour than those of Series A.

3.—Leaf scorch was present to the greatest extent in Series D.

The amounts present in Series A, B, G, were approximately equal. In Series E, F, the amounts of leaf scorch were less than in Series A. There was no leaf scorch present in Series C, H.

Thus it will be seen that in this experiment, when trees were grown in sand and fed with a complete nutrient solution, they developed a certain amount of leaf scorch. The amount of leaf scorch was increased by the omission of potash from the nutrient solution and decreased by the omission of calcium and phosphoric acid. Leaf scorch was entirely absent when nitrogen was omitted and when the trees were given rain water only.

(*c*) *Times of the falling of the leaves.*

On the occasions on which observations were made on the times of the falling of the leaves in the different series, observations were also made on the character of the leaves at that time of the year, and on the colour changes which were developed during the period of falling, etc., and it was observed that certain differences were apparent at this time of the season which had not been evident at the time of making the observations recorded on July 6th.

An account of the observations made on the individual trees on September 24th, and of some summarised results of observations made at later dates, is given below.

Observations made on September 24th.

Series A.

Nos. 1, 2, 3, 4.—There was no leaf scorch present on these trees.

No. 5.—A small amount of leaf scorch was present.

The trees of this series were still in full leaf. The leaves were of a normal green colour and showed no signs of falling.

Series B.

No. 1.—There was no leaf scorch present.

Nos. 2, 3, 4, 5.—A small amount of leaf scorch, mostly at the tips of the leaves, was showing on these trees.

The leaves were similar in size and colour, etc., to those of Series A.

Series C.

There was no leaf scorch present on any of the trees.

Nos. 3, 5, were completely defoliated.

Nos. 2, 4, were partly defoliated. The leaves remaining were pale green in colour.

No. 1.—This tree was in full leaf and the leaves were of normal size and colour.

Series D.

No. 1.—The leaves showed slight scorch, mostly at the tips.

Nos. 2, 3, 4, 5.—The leaves of all these trees were badly affected with leaf scorch.

The colour of the leaves where scorch was not present was similar to the colour of the leaves in Series A. Some leaves had fallen.

Series E.

Nos. 1, 2, 4, 5.—There was no leaf scorch present on these trees.

No. 3.—The leaves showed slight leaf scorch, mostly at their tips.

The leaves in this series were smaller than those in Series A, and were still green.

Some leaves had fallen.

Series F.

Nos. 2, 4.—There was no leaf scorch on these trees.

Nos. 1, 3, 5.—The leaves were showing a small amount of leaf scorch.

The leaves on all the trees were large and well developed. Some leaves on No. 2 were turning yellow.

Series G.

Nos. 1, 2, 3.—The leaves were slightly affected with leaf scorch.

Nos. 4, 5.—The leaves of these trees were severely affected with leaf scorch and were similar in appearance to those of the badly affected trees of Series D.

The leaves of all the trees of this series had commenced to fall.

Nos. 4, 5, had lost considerable proportions of their foliage. and the leaves remaining were in very poor condition.

By October 10th, the leaves of all the trees of this series were very badly affected with leaf scorch.

Series H.

There was no leaf scorch present on any of the trees.

No. 1 was still in full leaf, and the leaves were green.

Nos. 2, 3, 4, 5.—These trees were partly defoliated, and the leaves remaining showed a considerable amount of yellowing.

Summary of observations.

(1) The trees of Series D again showed the largest amount of leaf scorch. Those in Series G had developed leaf scorch to a great extent since July 6th, and they now showed leaf scorch second in amount to those of Series D. The trees in Series A, B, F, were affected with leaf scorch to similar extents. The amount of scorch present on the trees in Series B was slightly greater than on those in Series F, and slightly greater on the trees in Series F than on those in Series A.

The amount of leaf scorch in Series E was very small, and was less than in Series A.

As on July 6th there was no leaf scorch present on the trees of Series C, H.

(2) The trees of Series A, B, F, were still in full leaf. A small proportion of the leaves in Series D, E had fallen.

Some of the trees in Series G and H had lost a considerable proportion of their leaves. Two trees in Series C were completely defoliated, and two other trees were partly defoliated.

Observations made on October 21st.

Series A.—One tree was defoliated and two trees still retained practically all their leaves.

Series B.—One tree was defoliated, and the foliage remaining on the other trees was very sparse.

Series C.—Three trees were defoliated. The foliage on the two other trees was very thin.

Series D.—There was no tree completely defoliated. Four trees were carrying only a small amount of poor scorched leaves, and one had practically a full amount of healthy foliage.

Series E.—One tree was carrying a full amount of foliage. The amounts of foliage on the other trees were small.

Series F.—All trees had a fair amount of foliage on them. There was more foliage retained in this series than in any other.

Series G.—All the trees were practically defoliated, and the leaves remaining were poor and scorched.

Series H.—Two trees were defoliated, and two practically defoliated. One tree was carrying practically a full amount of healthy foliage.

Order of series of retention of leaves.—F, A, E, B, D, G, H, C.

Observations made on November 5th.

(1) Order of series of retention of leaves—F, A, B, E, D, G and H, C.

(2) Colour changes of the leaves were most strongly developed in Series C, F, H. E.

(3) The trees on the free stock types, previously referred to, were retaining their leaves best in all cases.

Observations made on November 19th.

Order of series of retention of leaves—F, A and B, E, D, G, C, H.

(1) The trees in Series H were all defoliated.

(2) With the exception of the trees in Series F, all the trees of the other series were either almost or completely defoliated.

Observations made on December 10th.

All the trees were defoliated.

(*d*) *Lengths and types of shoot growth made.*

Measurements of the lengths of shoot growth made by the trees during the season were taken on November 19th. On this occasion observations were also made on the characters of the shoots in each series. These results will be affected to a certain extent by the pruning which the trees were given after planting, but the differences in some cases are so great that there is no doubt that the amounts and character of shoot growth made have been determined to a great extent by the manurial treatments given. The results tabulated below will serve to give some idea of the orders of shoot growth made in the different series.

Series	Average per tree total shoot growth in ms	Length of longest shoot per series. in ms.	Observations on the type of shoot growth (i e thickness) made.
F.	1120·8	226	Shoots of medium thickness.
A.	939·2	256	,, ,, normal ,,
G.	924·6	177	,, ,, medium ,,
B.	799·6	211	,, ,, ,, ,,
E.	764·2	161	,, below medium ,,
H.	629·6	134	,, very thin
D.	608·2	139	,, below medium ,,
C.	560·2	133	,, very thin.

NOTE—The term medium denotes midway between normal and very thin.

Without wishing to lay any great stress on these results, it would appear that the omission of calcium may tend to increase the length of shoot growth, as it may also tend to prolong the growing period, as shown by the observations on the retention of the leaves, whilst the omission of potash or nitrogen or the withholding of food altogether would appear to limit the amount of shoot growth.

(*e*) *Types of root systems formed.*

The root systems of the trees were examined on December 10th, and the observations made are recorded in detail below.

Series A.

No. 1.—The root system of this tree differed in type from the remainder of the trees of this series. It is probably of the free stock type, whilst the others are of the Paradise stock type.

The root system of No. 1 was much smaller than those of the others.

Nos. 2, 3, 5.—The root systems were well developed and showed fair amounts of recent growth.

No. 4.—The root system of this tree was similar to those of Nos. 2, 3, 5, but not so well developed.

The root fibres in all cases were coarse. The roots in this series looked quite healthy.

Series B.

No. 1.—The root system was similar to that of A 1.

Nos. 2, 3, 4, 5.—These trees all had root systems similar in size, type of fibre, healthy appearance, and amount of recent growth to A 2, 3, 5.

Series C.

No. 1.—The root system was similar to that of A 1.

Nos. 2, 3, 4, 5.—The root systems were similar in size to those of A 2, etc. They differed from these in the fact that the root fibre was finer and there was practically no recent growth to be seen.

Series D.

No. 1.—The root system was similar to A 1.

Nos. 2, 3, 4, 5.—The root systems were all smaller in amount than the root systems of C 2, 3, 4, 5. The root fibre was similar in appearance to that of Series A, being coarser than in Series C. The roots showed more recent growth than those of this latter series.

Series E.

No. 1.—The root system was similar to A 1.

Nos. 2, 3, 4, 5.—The root systems were similar in size to A 3. The fibre was coarse and the roots appeared to be healthier in colour than in any other series. The amount of recent growth was greater than in Series A.

Series F.

The amounts of root formed by the trees of this series were less than in Series A, and the root fibre was finer than in this latter series. The amount of recent growth made was greater in this series than in any other.

Series G.

No. 4.—The root system was similar to A 1.

Nos. 1, 2, 3.—The roots of these were similar in size and character of fibre to those of Series A. There was a fair amount of recent growth to be seen.

No. 5.—The root stock appeared to be weaker than in Nos. 1, 2, 3, but was similar in type to these.

The roots of this series were inclined to be black, and it is probable that they were to a certain extent unhealthy.

Series H.

No. 1.—The root system was similar to A 1.

Nos. 2, 3, 4, 5.—The root systems of these trees were similar in amount and type of fibre to those of Series C.

The amount of recent growth was greater than in Series C, whilst the colour of the roots was slightly darker in this latter series.

Summary of observations on the root system.

Series D.—The amounts of root formed during the season by the trees in this series were smaller than in any other series. The root fibre was of a similar degree of coarseness to that in Series A. The amount of recent growth made was greater than in Series C, H.

Series C, H.—The root systems in these two series were similar in amount and type of fibre. The amounts in each series were almost equal to those of the trees in Series A., but the fibre was much finer.

In Series C practically no recent growth had been made, whilst in Series H there had been a certain amount of recent growth made.

Series F.—The amounts of root made by the trees were less than those made by the trees in Series A. The type of root fibre was similar to that of the trees in Series C, H. The amount of recent growth made was greater than in any other series.

Series G, E, A, B.—The amounts of root and the types of root fibre made by the trees in these series were similar.

In Series E, the roots looked healthier than in any other series, and the amount of recent growth made was second to that made in Series F.

The roots in Series A. B appeared to be practically identical in all respects.

The roots in Series G were blacker than those of the other series, which probably indicated unhealthy conditions.

NOTE.—Trees A 1, B 1, C 1, D 1, G 4, H 1, appeared to be on root stocks of the free stock type, whilst all the remaining trees were on stocks of the Paradise stock type.

EXPERIMENT ON STRAWBERRY PLANTS.

The variety used in this experiment is Royal Sovereign.

Eighty plants—10 per series—are being used in the series A—H, and two further series, X and Y,—six plants per series—have been commenced to test the effect of leaching the sand in the pots fortnightly against non-leaching of the sand.

In general, the details of the procedure described in the Experiment on Apple Trees have been followed in this experiment. The only points of difference are as under :—

The pots used are 6in. plant pots.

The tops of the pots are covered with waxed cardboard discs, each having a hole through the centre large enough to allow the roots of the plants to be passed through.

The weight of dry sand per pot used is 2.5 kilograms.

Planting.—All the plants were planted in the pots on December 11th, 1920.

Position of plants.—From December 11th, 1920, to March 24th, 1921, the plants were kept in the greenhouse, and on March 24th they were removed to a shelter which has three open sides and a glass roof. In this latter position the plants were practically under open air conditions, but were protected against rain. The plants were moved back into the greenhouse on October 20th, where it is proposed to keep them until next spring.

Pest attacks.—Just prior to the removal of the plants from the greenhouse to the shelter on March 24th, they were attacked in a mild degree by aphides, and these persisted on the plants during the summer. No spraying against pests was carried out, nor is it intended to do so in future seasons, as it is desired to make observations on the relation between the liability to injury from pest attacks and the various manurial treatments.

Observations made during the season.

Observations were made on the following points :—

(*a*) Growth of plants and types of foliage.
(*b*) Changes taking place on the foliage in autumn.
(*c*) Crop weights.

NOTE.—The plants have been allowed to fruit freely, but all runner formation has been checked.

(*a*) and (*b*). These are considered together below.

From the date of planting until the end of September, 1921, there was very little difference to be seen among the plants of the different series (excluding the plants of Series X and Y, which are not directly comparable, as these plants were smaller than those of the other series before the treatments were started) with the exception of the plants of Series C and H, in which series the plants had made no apparent growth throughout the season, though, perhaps, the plants of Series A were always a little larger than those of the other series. The plants of all the series, other than C and H, were of a good healthy green colour.

From the latter half of September, differences began to show up between the plants of the different series, and by November 19th considerable differences were apparent.

Details of observations made on various dates from September 24th onward are given below.

Observations made on September 24th.

All the plants were still green, those of Series C and H being slightly paler green in colour than those of the other series. The order of the series as regards size was—A, B, D, F and G, E, H, C. The plants in Series A were only slightly ahead of those of Series B in general appearance. Series B plants were slightly ahead of those of Series D, F, G. Series E plants were decidedly behind those of Series D, F, G. Series H and C plants were almost identical in appearance, and were much behind those of the other series.

Plants of Series X and Y.—The plants of both series were a good colour. Those of Series X (unleached) were between those of Series E and H in size, and those of Series Y (leached) were larger than those of Series E.

Observations made on November 19th, 1921.

The order of the series as regards size was—A, B, D and F, G, E, C, H.

Series A.—The plants looked healthy, the leaves being green and well developed.

Series B.—The plants looked healthy, but the leaves were generally smaller than in Series A, and some were lighter green in colour, and looked as though they were beginning to change colour.

Series C.—The plants were very poor and much of the foliage had turned yellow or red.

Series D.—The plants were very similar to those of Series B, though the leaves, on the whole, were slightly smaller than those of this latter series. All the leaves were still green.

Series E.—The plants of this series were much behind those of Series D, F and G. They were much smaller, and looked unhealthy. The leaves showed much yellowing.

Series F.—The plants were identical in appearance to those of Series D.

Series G.—The plants were similar in appearance to those of Series F, but were slightly smaller. The leaves had shorter stalks, and were smaller than in F. They were beginning to change in colour to pale green and yellow.

Series H.—The plants were slightly behind those of Series C in appearance. Most of the leaves were red or yellow in colour, and very few were green. On the whole the plants showed more reddening of the leaves than in Series C, where the leaves had changed more to yellow than red.

Series X.—The plants were slightly larger than in Series H, the leaves also being larger. They showed no tendency to turn yellow, but many showed a brown marginal scorch.

Series Y.—The plants were much better than in Series X. Some of the leaves were turning yellow, and there was no brown marginal scorch, as in X.

Observations made between November 19th—December 13th, 1921.

Numerous observations on the plants were made during this period. The order of the series, as regards size of plants, did not change during this time, but the leaves in all the series had developed much change in colour and some of the foliage of all the plants had turned brown and dried out. The plants in Series C, H and X, were all in very poor condition, and they will probably have some difficulty in commencing growth next spring. With regard to the colour changes of the leaves, which took place during this period, the leaves in all the series, with the exception of Series C, H and X, had changed to yellow or reddish yellow. In Series C and H the change had been more to red than yellow, and more so in Series H than in Series C. In Series X the leaves had developed a brown marginal scorch, which had spread over the whole areas of the leaves, and had not turned either yellow or red.

Summary of Observations on the Growth of the Plants.

(1) The plants fed with the complete nutrient solution in Series A have made good growth.

(2) Nitrogen and phosphoric acid appear to be very essential to the growth of strawberry plants.

(3) The omission of potash, calcium and magnesium respectively has not restricted the growth of the plants to a great extent during one season.

(4) As the result of non-leaching of the contents of pots receiving a complete nutrient solution, the plants developed a brown marginal scorch at the end of the season. Two plants of this series have died during the season.

(*e*) *Crop weights.*

The crop weights of the individual plants have been recorded during the season, but it is felt that no useful purpose would be served in publishing these at this stage of the work.

FRUIT BREEDING INVESTIGATIONS.

(*G. T. Spinks.*)

During the year 1921 the work on fruit breeding has been continued on the lines indicated in the Report for 1920. A large number of new seedlings have been raised, the same results as before having been aimed at when making the crosses. Observations have been made on the older seedlings which are bearing fruit, and it has now been possible to discard a number of inferior seedlings, retaining for further trial only those which show signs of distinct superiority. For the next few years the work will consist to an increasing extent in recording the characters of the seedlings which have now been raised, and in selecting the best. Fewer crosses will be made: they will be chiefly duplicates of older crosses, and will be made with the object of increasing the number of individuals in a few families. It is probable that it will be better to obtain some information from the older crosses before making a large number of further new crosses. A few more details of the work in progress with the various fruits is given below.

APPLES.—The following crosses were made :—

Cox's Orange Pippin × D'Arcy Spice
Ditto × Kings Acre Pippin
Ditto × Ribston Pippin
D'Arcy Spice × Cox's Orange Pippin
Ribston Pippin × Ditto
Court Pendu Plat × Royal Jubilee
Royal Jubilee × American Mother
Sweet Alford × Cox's Orange Pippin
Ditto × Bismarck
Bramley's Seedling × Sweet Alford
Lane's Prince Albert × Ditto
Wealthy × Sweet Alford.
Bismarck × Morgan Sweet
Bramley's Seedling × Ditto.
Lane's Prince Albert × Ditto.
Newton Wonder × Ditto
Stirling Castle × Ditto
Edward VII. × Wellington
Newton Wonder × Ditto
Peasgood's Nonsuch × Ditto
Wellington × Lane's Prince Albert.

It will be noticed that two varieties of cider apple, Morgan Sweet and Sweet Alford, have been crossed with several market varieties: reference to the possibilitity of useful results from such a cross was made in last year's Report. The only family of apple seedlings in which a number of individuals have fruited yet is a cross between the two cider apples—Medaille d'Or and Kingston Black. A detailed account of the characters and chemical compositions of the fruit of these trees will shortly be published in a separate article.

PEARS.—The following crosses were made :—

Catillac × Conference
Louise Bonne × Ditto
Pitmaston Duchess × Ditto
Williams' Bon Chretien × Conference
Dr. Jules Guyot × Ditto
Ditto × Pitmaston Duchess

Late blossoming was added to the list of desirable characters when making out the programme of crossing for this year.

PLUMS.—The following crosses were made :—

President × Czar
Pond's Seedling × Ditto
Czar selfed
River's Early × Purple Egg
Ditto × Pershore
Victoria × Ditto
Victoria × Giant Prune
Coe's Golden Drop × Ditto
Jefferson × Ditto
Giant Prune × Jefferson
Ditto selfed

The production of a good plum of the prune type, suitable for drying, is being attempted, in addition to the other projects noted last year.

CURRANTS AND GOOSEBERRIES.—With the same objects in view as last year, the following blackcurrant crosses were made in 1921:

Baldwin × Boskoop
Ditto × French
French selfed
French × Baldwin
Boskoop × Ditto
Ditto, selfed.

From a batch of about 300 of the older blackcurrant seedlings, which had been under observation for several years, 20 have been selected as worthy of further trial, the remainder being discarded. The bushes were selected for their cropping powers and for their freedom from big bud and reversion.

Work with gooseberries this year was confined to the selfing of Careless, Keepsake, May Duke, Whinham's and Whitesmith, in the hope of obtaining a heavy cropping and very early berry for picking green.

RASPBERRIES, ETC.—No crosses were made this year, but a large number of open-pollinated seeds of the varieties—Abundance, Bath's Perfection, Baumforth's Seedling, Bountiful, Devon, Hornet, Lloyd George, Park Lane, Royal, and Superlative, were obtained. The intention is to raise several hundred plants from the seed obtained from each variety, and simply to select anything of outstanding merit which may appear, and to discard the rest. About a hundred seedlings have been raised from the seed of the selected wild blackberries, and when they commence fruiting they will be kept under observation in case any noteworthy fruit appears.

STRAWBERRIES.—The same system as last year was followed in deciding the crosses to be made, and the following were the crosses made this year:—

Bedford Champion × Maincrop
Ditto × King George V.
British Queen × La Perle
Ditto × Reward
Cropper × Vicomtesse
Fillbasket × Bedford Champion
Givon's Late × St. Antoine
King George V. × Keen's Seedling
Ditto × St. Antoine
Laxton's Latest × Earl
Laxtonian × International
Leader × St. Antoine
Louis Gauthier × Keen's Seedling
Maincrop × Bedford Champion
Madame Kooi × Dr. Hogg
President × British Queen
Queen × Dr. Hogg
Royal Sovereign × King George V.
Scarlet Queen × Ditto
Sir J. Paxton × Dr. Hogg
Ditto × St. Antoine
Vicomtesse × Cropper
Waterloo × Laxton

The crop on many of the fruiting seedlings was somewhat spoilt this year by a frost, which killed many of the earlier flowers; but notes on the fruit of the various seedlings were made as completely as possible under the circumstances. The remainder of the plants from crosses made in 1916 and earlier years were subjected to a still further process of selection, and the few which were thought worthy of further trial are being grown in larger numbers. A preliminary selection was also made from the plants from the 1919 crosses. Plants from 1920 seed have made good crowns, but have not fruited yet. Owing to early sowing, strong young seedlings from 1921 seed were obtained in the autumn, and will be planted out in the spring.

TOMATOES.—An F_2 generation of eight families of crosses made in 1919 was grown this year. As with the other fruits, so with tomatoes, the crosses were made mainly with the object of producing some improved varieties suitable for cultivation. Several uncommon types, or varieties not grown commercially, were used as parents in some crosses, merely on the chance that something useful might result from the cross, and, therefore, some peculiar types of fruit have appeared in the F_2 generation. Probably these, and the great majority of the plants grown this year will not be grown on for another generation, as it is outside the scope of this Station to work out the genetics of the tomato. But several plants from each family were selected as being of probable value, and as many as possible of these will be carried on for at least one more generation, and crop records will be taken. Pure-breeding strains will doubtless be obtained from some of these, and may be useful either as new varieties, or, at all events, as parents, in making further crosses. In 1920 about 10 plants of the F_1 generation of each family were grown in a glasshouse. This year 60 F_2 plants of each family were grown in the greenhouse, and a similar number in the open garden. Unfortunately, it was found impossible to take complete notes on all these plants, and practically no notes were made on the outdoor plants. But the outdoor plants were, apparently, simply a duplication of those grown inside, and nothing was noticed amongst them which had not already been seen in the indoor plants. The plants were grown in the open with the object of detecting any plant which might be specially suitable for open air culture; but nothing of this sort was found, as all the plants succeeded so well owing to the abnormally hot and dry season.

A summary of the characters of the various families is given below. The chief points noted are the size, shape, and colour of the fruit, and the size and shape of the truss. The female parent is placed first in each case.

(1) *Ailsa Craig* × *Currant* (*L. pimpinellifolium*).

Ailsa Craig.

Truss moderately compact, sometimes branched, with 5 to 8 fruits. Fruit rather flattened, 2·3 to 2·8 inches in diameter, red, moderately glossy.

Currant.

Truss very long, unbranched, with about 30 fruits. Fruit round, ·5 to ·6 inches diameter, dark red, very glossy. Plant slender, foliage pale, leaves with many small, almost entire, leaflets.

The shape of the fruit refers to the vertical section; unless otherwise stated the horizontal section is assumed to be round. The number of fruits per truss is the average number of fully developed fruits which were present.

This cross (also Crosses 3, 5, 6 and 7) was made with the object of obtaining a plant bearing long trusses of good-sized fruit, of good shape and colour.

F_1 *generation.*

Nine plants were apparently identical and the following description applies to all of them. Truss fairly long, unbranched or sometimes slightly branched, with about 12 fruits. Fruit 1·1 inches diameter, round, dark red, glossy.

F_2 *generation.*

Sixty plants. Truss long or very long, often branched, with 10 to 25 fruits. Fruit usually round, a few flattened, and one oval, ·7 to 1·4 inches in diameter, dark red, very or fairly glossy.

Descriptions and measurements of every plant were not made.

The F_1 plants were intermediate between the parents in most respects, *e.g.*, length of truss, number of fruits on the truss, size of fruit and character of foliage; but the round shape and glossiness of the fruit seem to be dominant characters. The F_2 plants were also all intermediate between the parents, though partial segregation of characters occurred. There was much variation in the size of fruits and trusses, but in no case were the extremes reached, which are found in the parents. This is, perhaps, the result to be expected when dealing with what are mainly quantitative characters. In the case of the shape and glossiness there is a more complete segregation, the round shape and very glossy skin being apparently dominant, so that the majority of the fruits are round and very glossy, though a minority are flattened and less glossy. The shape, however, is probably due to a complication of factors, as is evident from the results of other crosses. The subject of shape in tomatoes has been dealt with by Crane. Only two plants of this F_2 family were selected for further propagation, and seeds of these were saved.

(2) *Ailsa Craig* × *Pear* (*L. pyriforme*).

Ailsa Craig.—See (1).

Pear.

Truss fairly compact, unbranched, with about seven fruits. Fruit pear-shaped, diameter 1·3 inch, length 1·9 inch, red, fairly glossy.

F_1 *generation.*

Six plants—Nos. 1, 2, 3 and 6.—Truss moderate, compact, irregular, with about nine fruits. Fruit round, diameter 1·6 inch., red. Nos. 5 and 7.—Truss rather long, irregular, with seven fruits. Fruit oval or oblong, diameter 1·8 inch, red.

F_2 *generation.*

Forty-eight plants were raised from seed from No. 1, and 10 each from Nos. 5 and 7. There was much variation in these plants, and without further and more detailed work with larger numbers it is impossible to draw conclusion about the inheritance of various characters. The extent of the variations may be judged from the following general description: Truss fairly compact or long, sometimes branched, with 5 to 15 fruits. Fruit very variable in shape, round, flattened, oval, oblong, square, and pear-shaped, diameter 1 to 2·3 inches, red, moderately glossy. This great variety of shape of the fruit was also found by Crane, when he used a long-fruited tomato, "Wonder of Italy," as a parent.

(3) *Balch's Fillbasket* × *Dobbies's Garland.*

Balch's Fillbasket.

Truss moderately compact, unbranched, with six fruits. Fruit flattened or almost round, slightly ribbed, diameter 2·5 inches, red, moderately glossy.

Dobbie's Garland.

Truss long, unbranched, with about 25 fruits. Fruit round, diameter ·8 to 1 inch, dark red, very glossy. (Very similar to the "Currant," but the fruit is distinctly larger and there are not quite so many fruits on the truss.)

---

* "Heredity of Types of Infloroscense and Fruits in Tomato."—*Journ. Genetics.* Vol. V., 1915, p. 1.

F_1 *generation.*

Truss fairly long and lax, often branched, with 12 to 20 fruits. Fruit round, diameter 1·2 inch, dark red, glossy.

F_2 *generation.*

Truss long or very long, often with 2 or 4 branches. Number of fruits varies between 8 and 80, the latter number occurring on a long 4 branched truss. Fruit round or rather flattened, diameter ·9 to 1·8 inch, red, moderately or very glossy.

The inheritance of size, colour and shape is on the whole similar to that found in cross (1), the F_1 plants being intermediate and all alike, while the F_2 plants are also all intermediate, but have a fairly wide range of variation. The characters of Dobbie's Garland seem to be more or less dominant. Of the 60 F_2 plants 15 were classified as having fairly large fruit, and 45 as small or medium fruited. In addition to the typical round or slightly flattened fruit, two plants were found bearing distinctly oval fruits, and several others with slightly oval fruit. It is noticeable that the F_2 plants included some with trusses much longer, and bearing many more fruits than those of either of the parents. Three plants with trusses bearing 8 to 12 fruits each, about 1·8 inch in diameter, were selected for further propagation.

(4) *Balch's Fillbasket* × *Yellow Peach.*

Balch's Fillbasket.—See (3).

Yellow Peach.

Truss moderately compact, unbranched, with 5 to 7 fruits. Fruit round, slightly flattened, diameter 1·9 inch, pale yellow, dull, pubescent.

F_1 *generation.*

Truss fairly compact, rather irregular, with 7 fruits. Fruit slightly flattened and slightly ribbed, diameter 2·2 inch, rather pale red, dull.

F_2 *generation.*

Truss compact to moderately long, with 5 to 8 fruits. Fruit round or flattened, diameter 1·8 to 2·5 inch, red, pink or yellow, dull or glossy.

Detailed notes of each plant were not taken in this case, but on the whole the inheritance of characters seemed to be the same as in (8) below. Only one plant was selected for possible further trial.

(5) *Holmes's Supreme* × *Currant.*

Holmes's Supreme.

Truss moderately compact, with about 4 (3 to 6) fruits. Fruit rather flattened, slightly ribbed, diameter 2·3 inch, dark red, fairly glossy.

Currant.—See (1).

F_1 *generation.*

Truss moderately compact, seldom branched, with 12 to 20 fruits. Fruit round, diameter 1 inch, red, fairly glossy; 12 plants all alike.

F_2 *generation.*

Truss moderately or very long, with 12 to 25 fruits. Fruits round, diameter ·7 to 1·4 inch, red, fairly glossy. Here again notes were not made on all individuals, but the family as a whole was very similar to (1) and (6). Two plants were selected for propagation.

(6) *Kondine Red* × *Currant.*

Kondine Red.

Truss fairly compact, with 5 fruits. Fruit slightly flattened, diameter 2·3 inch, red, moderately glossy.

Currant.—See (1).

F_1 *generation.*

Truss long, seldom branched, with 11 to 14 fruits. Fruit round, diameter 1 inch., red, very glossy. The 12 F_1 plants were all alike and in most respects were intermediate between the parents, though the round shape of the fruit seems to be fairly dominant.

F_2 *generation.*

Truss compact, moderate or long, usually unbranched, with 6 to 20 fruits. Fruit round or flattened, diameter ·7 to 1·4 inch, red, glossy.

In the F_2 generation there was much variation amongst the 60 plants which were observed, though, as in (1), the limits of the original parents were never reached. As regards the type of truss, approximately equal numbers were noted as compact, moderate, and long, though no actual measurements were made. The majority of the fruits were about the same size as those on the F_1 plants, and three quarters of the total numbers were between ·8 and 1·2 inch in diameter. Seven plants bore fruit over 1·2 inch in diameter, but the largest fruits were 1·4 inch, no fruit approaching anywhere near the size of that of Kondine Red. The fruit of eight plants had a diameter of less than ·8 inch, but in only one case was the fruit as small as that of the Currant. The size of the fruit in all the plants of the F_2 generation is, therefore, seen to be much influenced by the Currant parent. This is also the case with the shape of the fruit, as on 28 plants it was classified as round, on 23 as slightly flattened, and on 6 as distinctly flattened. All the fruits were described as red and glossy, but no further details were noted, except that in one case a fruit was described as dark red. Six plants occurred which were distinctly dwarfed and slender in growth, and resembled the "Currant" parent in their foliage and fruit, though only one of them bore fruit quite as small as the "Currant" and none of them carried so many fruits on each truss.

(7) *Kondine Red* × *Dobbie's Garland.*

Kondine Red.—See (6).

Dobbie's Garland.—See (3).

F_1 *generation.*

Truss long, sometimes branched, with 10 to 12 fruits. Fruit slightly flattened, diameter 1·4 inch, red, glossy. 9 plants.

F_2 *generation.*

Truss moderate to very long, sometimes branched, with 6 to 40 fruits. Fruit round, flat or intermediate, diameter ·7 to 1·9 inch, red, glossy.

On the whole the products of this cross resemble those of cross (3). The F_1 plants are again intermediate in almost every respect. The F_2 plants are also usually intermediate, though a few are more extreme than the parents. On one plant branched trusses carrying up to 40 fruits occurred. Most of the fruits were between 1·2 and 1·7 inch in diameter, though a few were smaller or larger than this, 9 of them being as small as the fruit of Dobbie's Garland, though none were as large as Kondine Red. The fruit of 15 plants was round, that of 5 was much flattened, and that of the remainder of an intermediate shape. Most of the fruits were regular in shape, but 4 of the more or less flattened ones were ribbed. All the fruit was red and glossy, two plants being noted as bearing very bright red fruits.

Two plants were notable for the extraordinary growth in length which they made: they were stopped, like all the other plants, above the fourth truss of fruit, and were then two or three feet higher than the rest of the plants. These plants bore extremely long fruit trusses, the longest being 5ft. 6in. long; but the trusses usually bore about 20 small fruits, as the flowers were very far apart and many of them failed to set fruit; the flower stalks were also much longer than usual.

This cross was, perhaps, the most promising of any as regards the production of useful types of plants, and seed from five of these was saved for further trial.

(8) *Kondine Red* × *Yellow Peach.*

Kondine Red.—See (6).

Yellow Peach.—See (4).

F_1 *generation.*

Truss moderately long and irregular, with 5 to 7 fruits. Fruit rather flattened and slightly ribbed, diameter 2·2 inch, pale red, dull.

F_2 *generation.*

Truss moderate in length, sometimes branched, with 4 to 10 fruits. Fruit either flat or somewhat flattened, often ribbed, diameter 1·5 to 2·8 inch, red, pink or yellow, moderately glossy or dull.

The chief point of interest in this cross is the inheritance of colour. In the F_2 generation there were counted 25 rather pale reds, 12 pinks, 9 dark yellows, and 4 light yellows. Reds have red flesh and dark yellow skin, pinks have red flesh, but a colourless skin, dark yellows have yellow flesh and yellow skin, and light yellows have yellow flesh but colourless skin. It seems likely that with a larger number of plants a 9 : 3 : 3 : 1 : ratio between the different colours would have been obtained, red flesh being dominant to yellow, and yellow skin dominant to colourless, but the flesh and skin colours being independent of each other. This agrees with the observations of other breeders of tomatoes. The dull surface of the Yellow Peach appears to be at all events partially dominant. Another point of interest which appeared was the tendency of much of the fruit on the outdoor plants of this cross to become soft long before it was ripe—a character to be avoided, inherited from the Yellow Peach parent. Actual figures of the proportion of fruits which showed this character are not available, but it was probably a large majority of the F_2 fruits. Three plants were selected for a possible further trial.

No information with regard to the inheritance of susceptibility or resistance to disease has been obtained from any of the crosses, as the whole of the plants for the last two years have been remarkably free from *Cladosporium* and other diseases.

THE INFLUENCE OF REVERSION (NETTLE LEAF) ON SUCCESSFUL BLACK CURRANT GROWING.

(*A. H. Lees.*)

For some years past black currants have made very good prices in the open market, sufficiently good indeed to tempt many who lacked adequate experience to try their culture. While some have succeeded many have encountered failure through lack of sufficient knowledge of the essentials for success. As a result of the efforts of various workers during the past few years these essentials are now much more clearly defined than hitherto, and it is possible to give some definite information to guide the prospective grower. On such points as soils, pruning and to some extent manuring, information is already available and it is not proposed to discuss these factors here. One may presume that the prospective grower either possesses, or can obtain such information. The two greatest difficulties are the selection of the right variety and control of disease. Hatton* has shown, and the general experience of the best growers agrees with him, that the varieties belonging to the Baldwyn group are very decidedly the best croppers. These are however, perhaps more liable to disease than some of the other types, and it is disease that is usually the greatest hindrance to the production of profitable crops.

The most serious diseases of the Black Currant are undoubtedly Big Bud and Reversion, the latter being especially destructive. Evidence is accumulating that the two diseases are very closely connected and that the presence of Big Bud, when it has obtained a good hold, is always accompanied by Reversion.

It does not follow, however, in the absence of Big Bud that Reversion is absent. Bushes showing no sign of mite attack may be, and frequently are, reverted. The position, therefore, appears to be that a bush may be reverted without Big Bud, but that the presence of Big Bud increases the amount of Reversion.

Reversion is thus more feared amongst growers than Big Bud, because a reverted bush means a big loss of crop, while a big-budded bush, if in the initial stage only means a small loss. It is clear, therefore, that Reversion is the most important factor of all in the success or failure of black currant growing.

---

* *Journal of Pomology.* Vol. II. p. 160.

The problem before the grower is twofold. First he must obtain nursery stock that is free from Reversion and secondly he must keep his plantations free from the presence of reverted bushes. To obtain free stock the cuttings must be taken from bushes that are not reverted and kept clean in the nursery, until the grower obtains possession. The best nurseries endeavour to do this, but not always with complete success. One method is to take cuttings only from fruiting bushes. At first sight this would appear to guarantee success, but in practice complete freedom is not obtained by this method. It is quite possible for a single branch only of a bush to be reverted, or for Reversion to have entered so recently that fruiting is not affected.

In either case there is a danger of some of the cuttings subsequently showing Reversion. Again it is the practice of nurseries that are short of stock to take cuttings from plantation bushes, and from one or two year old cuttings and not only from their stool beds. These one or two year old cuttings or plantation bushes may have contracted the disease after they were planted even though clean at their start. Finally, bushes bought in from other sources and not raised on the spot are specially liable, since in many cases little care has been taken to keep them free.

It is thus clear that the only satisfactory way for nurseries to produce clean stock is to take cuttings from stool beds only, until such time as they have eliminated the disease from their grounds. Even then it is safer to keep to stool bed propagation only, since there is always a possibility of the disease being contracted in the cutting beds. There are two possible ways to test the stool beds. The first is to let one or two canes in each stool stay for two years so as to fruit. Those that drop their fruit should be grubbed. In this way the worst examples will certainly be eliminated, but it is possible, though not certain, in the present state of knowledge that intermediate types will not be noticed.

The second way is the method described in the Report for 1920. This method depends on leaf character and may be employed during several weeks of the growing season. It does not interfere in any way with the growing of the stools for cuttings, and is thus a method that can be used every year. It enables the observer to find slightly affected cases, as well as pronounced ones, and thus is more rigorous than the first method. Needless to say in roguing stool beds, even suspicious cases should be removed.

Employment of such methods to the stool and cutting beds would enable nurseries to send out absolutely healthy stock. That this is not so at present is shown by experience of bought in plants at

Long Ashton. The plants were obtained from nurserymen and growers of good reputation, and no attempt was made to hide the fact that they were for experimental purposes. Out of 612 bushes that were planted, 57, or 9% were reverted the following year. Of these, 142 bought from a grower produced 35 reverts, or 25%, and 470 from first-class nurserymen produced 22 reverts or 5%. It is clear, therefore, that at the present time the prospective grower cannot depend on obtaining completely healthy stock, even from good nurseries. It is highly desirable that nurserymen in general should evolve or submit to some scheme, which would ensure the production of healthy stock only.

After obtaining healthy stock the grower has still to face the problem of keeping his plantations healthy. This clearly involves a knowledge of how the disease obtains access to healthy bushes. It is an acknowledged fact that Reversion and Big Bud are often closely associated. Further it has been shown in another article of this Report that the presence of Big Bud increases the amount of Reversion and the absence decreases the amount. In another paper it has also been shown that if any shoot, previously healthy, is attacked by mite it has a tendency to produce reverted leaves and that this tendency is greater, the greater the infection of mite. There is, therefore, a strong probability that Reversion starts on a healthy bush, when that bush is subjected to mite attack. A few bushes under control have become reverted in the second year, after being normal and free from Big Bud in the first year, but the percentage was too small to rely on freedom from personal error. It is probable, therefore, though not certain, that it is chiefly through mite attack that Reversion gains access to healthy bushes. The grower, however, is not yet in a position to control mite attack by spray methods, and therefore his only chance of keeping his plantations free from reverted bushes is by roguing. Reverts may be identified easily by the leaf-vein method, and their removal need not take place till after their crop, such as it is, has been gathered.

The place of such bushes must be filled in the following autumn from cutting beds which every grower should keep going. Not many cuttings need be taken every year, but only marked, healthy bushes should be used for the purpose. The cutting beds also should be carefully rogued. The method has already been tried by one grower with considerable success. In addition Big Bud has practically disappeared as the result of the treatment, a fact which supports the idea that the first signs of Reversion in a healthy bush are due to mite infection.

RED PLANT DISEASE OF STRAWBERRIES.

(*A. H. Lees.*)

This disease of strawberries has been reported to the Bristol Advisory Centre by Inspectors of the Ministry working in the Southampton, Cheddar and Tamar Valley districts. The name may cover one or more diseases, but as the purpose of this report is not explanatory, but merely informative the name is used regardless of its possible accuracy.

Distribution.—The disease has been seen in the Southampton, Cheddar and Tamar Valley districts, but not in the strawberry growing regions of Herefordshire and Worcestershire. There is reason to suppose that the disease at Cheddar is of a different order from that of the other two districts.

Damage Done.—This is serious around Swanwick, though it is impossible to assign percentage figures to the disease. Judging from growers' reports it is also serious in the Tamar Valley, but this district was not so extensively surveyed as that of Southampton. It is safe to say, however, that in both districts it is the most serious factor limiting the profit of strawberry growing.

Symptons.—In these two districts the disease turns up in definite patches. These patches are rather irregular in shape, though sometimes roughly circular, sometimes oval. The limitations of the patches are not clearly defined, but usually shade off rather abruptly into the normal. In size they vary from about 4 square yards to about 40 square yards. The distribution of patches is irregular. Fresh runners planted in such patches grow almost if not quite normally during their maiden year. In the second year they become very much checked and this check is accompanied by very feeble root development from the new crowns. In the third year they either die outright, or remain in a very checked condition. They may even die in the second year. If replanted with local runners these patches reappear in the second year. If non-local runners are used the same thing happens, but the effect is not so marked.

History of the Patches.—No certain information can be obtained, but the general opinion is that they are not getting less in size, but if anything are growing. They certainly reappear year after year if planted with strawberries. One case in the Tamar Valley is of special interest. The field had been thirty years in grass, then three years in strawberries and a patch was very well defined.

Possible Causes—

(*a*) *Lack of Lime.*—At first this appeared as a possible cause. but soil analysis and liming experiments have practically ruled this out.

(*b*) *Lack of Manuring.*—The patches have received the same manuring as the normal parts (at Swanwick generally town dung). It is not likely, therefore, to be due to insufficient manuring.

(*c*) *Eelworms.*—Neither at Tamar nor Southampton could parasitic eelworms be found in the affected plants. At Cheddar eelworm was found, but no " patches." Such plants occurred irregularly in the row and the disease appeared to be of a different order from the " patch " disease of Southampton and Tamar Valley.

(*d*) *Soil.*—It is possible that the mechanical make up of soil or subsoil is responsible for these patches, but no analytical evidence is yet to hand. Both Tamar Valley and Southampton soils are light, while in Worcestershire and Herefordshire, where the disease does not appear, they are heavy.

General Irregularity of Plant.—Apart from the definite patches the most striking feature of Southampton and Tamar Valley strawberry plantations is the variation in size of plants of the same age in the rows. The growers do not complain of this, but it is evident that this is also limiting the size of crop per acre. The irregularity is not confined to patches, but extends everywhere, and the difference in size in neighbouring plants is often very marked. Plants from local sources suffer far more than plants obtained outside the district. The evidence for the influence of land long under strawberries or newly so is not nearly so clear. If anything plantations on newer lands are better, but these lands are also often slightly heavier. A superficial view tends to the idea that the local strains are degenerating in vigour.

*THE BEHAVIOUR OF PECTIN TOWARDS ALKALIS AND PECTASE.**

(Frank Tutin.)

Pectin is a plant product which plays a part of considerable importance in the jam and fruit-preserving industries, and problems connected with it also arise in the making of wine, cider, perry and other fermented beverages made from fruit juices. It is present in fruits and also in roots, such as carrot, turnip, etc., in which parenchymatous tissue is largely devéloped. A solution of pectin in presence of suitable quantities of sugar and an acid readily forms a gel, and it is to this property that the "setting" of jams and jellies is due. It may be prepared by the addition of alcohol to an aqueous extract of the respective fruit, when the pectin separates as a voluminous, gelatinous precipitate. Athough the product so obtained cannot be considered in the strict, chemical sense as a pure compound no doubt can be entertained that it is, essentially, an individual substance. It cannot be crystallised, and the only methods of purification which have, so far, been found practicable are treatment in aqueous solution with animal charcoal and reprecipitation with alcohol.

---

* From the *Biochemical Journal,* Vol. XV, 4, 1921.

The literature on the subject of pectin is voluminous, but a perusal of it reveals a great deal of confusion, and contradictory statements are frequent.

The present communication embodies the results of some preliminary work on pectin, and deals with the action of alkalis and of the enzyme, pectase, on this substance. It has long been known that pectin, on treatment with an alkali, yielded pectic acid, a substance which is insoluble in water in presence of an appreciable amount of an electrolyte. More recently Th. von Fellenberg[*] has shown that the product obtained on distilling pectin with aqueous alkali contains methyl alcohol. Although he never made any thorough examination of the distillate he concluded, from indirect evidence obtained by several methods, that methyl alcohol was the only volatile product formed. To the present author, however, this conclusion did not seem to be justified, and investigation has proved this to be the case. Lippmann[†] speaks of it as a well-known view that pectin it a methyl ester of "pectinic" acid, and attributes the presence of methyl alcohol in rum to the decomposition of pectin derived from thes ugar cane.

No definite information appears, so far, to have been obtained regarding the action of the enzyme, pectase, on pectin beyond the fact that it causes a solution of the latter to set to a stiff gel, and that this change occurs more readily in the presence of chalk. The production of the gel has been considered to be due to the formation of calcium pectate.

The present author finds that the actions of cold, dilute alkali and of pectase on pectin are essentially identical. In both cases a salt of pectic acid is formed and not only methyl alcohol, but also acetone, is eliminated. In this connection it is worthy of record that both methyl alcohol and acetone have now been found to be present in cider, being doubtless derived from the pectin, which becomes destroyed during the fermentation of the apple juice.

---

[*] Von Fellenberg. *Chem. Zent.* 1914. II. 942.

[†] Lippmann. *Biochem. Zeitsch.* 1920. 106, 236.

Both the acetone and the methyl alcohol are eliminated with great facility from pectin, a small quantity of $N/10$ alkali at ordinary temperatures being sufficient to set free both compounds. This would suggest that both of them were present as ester groupings, the acetone occurring as an ester of its enolic modification, *iso*propenyl alcohol, $CH_3 . C(OH) : CH_2$. It appears likely, therefore, that pectin is the dimethyl*iso*propenyl ester of pectic acid.

EXPERIMENTAL.

The pectin employed in this investigation, except where otherwise stated, was obtained from apples. Dried "pomace" (the "press cake" from the cider press) was heated to 100° with water and the liquid subsequently expressed. The pectin was then precipitated by the addition of alcohol to the dark-coloured solution, collected, pressed free from mother-liquor, and purified by solution in water and re-precipitation by alcohol. As thus obtained the pectin formed a brownish, voluminous, jelly-like precipitate, which could be deprived of a large volume of occluded mother liquor by careful pressing in a cloth. Further purification was effected by treatment with animal charcoal in dilute aqueous solution. The first treatment with animal charcoal caused an appreciable diminution of the amount of material in solution, but subsequent treatments resulted in the absorption of only small quantities of the pectin, thus indicating that the initial loss was due essentially to the removal of impurities. On precipitating, the pectin after this purification separated as an almost colourless, jelly-like precipitate which, when dried, formed a greyish solid which could be reduced to a nearly white powder. The yield was nearly 5% of the weight of the dried pomace employed.

The action of alkali on pectin.—All samples of pectin were found to possess a slightly acid reaction and the purified material (dried in a vacuum) when titrated, neutralised immediately in the cold 1·05% of its weight of sodium hydroxide. On keeping, however, in aqueous solution at ordinary temperature in presence of an excess of the alkali a further amount of the latter equivalent to 12·35% of the weight of the pectin employed was taken up, the reaction being practically complete in half-an-hour, only a trace more akali being neutralised on keeping for a further 18 hours. On then adding an excess of acid to the solution pectic acid was precipitated. When pectin was heated to about 80° with excess of *N* 10 alkali, however, much more of the latter was neutralised, considerable darkening occurred, and no definite end-point to the reaction could be ascertained Moreover, on acidifying the alkaline mixture after heating for two hours no pectic acid was precipitated.

It has been recorded by von Fellenberg (1914) that pectin yields methyl alcohol when distilled with an excess of aqueous alkali, and this reaction was therefore investigated. A considerable quantity of pectin, in aqueous solution, was treated with an excess of sodium hydroxide and the mixture distilled in a current of steam for some time. It was at once evident that the distillate contained something other than methyl alcohol since it readily yielded iodoform on treatment with iodine and an alkali. The entire distillate* was therefore submitted to a systematic process of fractional distillation, employing a Young's rod and disc column, when it was separated into water and a fraction boiling below 70°. The latter, after drying over quick lime, was re-fractionated several times, again employing an efficient column, when it passed over from 56 66° and was finally collected in eight fractions, all of which were analysed. The fraction boiling at 66° consisted of methyl alcohol (found: $C = 37{\cdot}5$, $H = 12{\cdot}6\%$), whilst that boiling at 56–58° evidently consisted chiefly of acetone. It has a strong odour of the latter, gave $C = 58{\cdot}5$, $H = 10{\cdot}8\%$, and readily yielded acetonesemicarbazone, melting at 186°. The regular change in the composition of the intermediate fractions, as shown by analysis, clearly indicated that no third substance was present. The proportion of acetone to methyl alcohol produced appeared to be about one part of the former to two of the latter.

Pectin was then treated in cold, aqueous solution with 13·4% of its weight of sodium hydroxide (the amount taken up by pectin in the cold), the mixture kept for 30 minutes, then made slightly acid, and distilled as before. It was then found that both acetone and methyl alcohol were formed, and to the same extent and in the same proportion as when the distillation had been conducted in the presence of a considerable excess of alkali. Moreover, when an amount of alkali sufficient to react with only half the pectin taken was employed both acetone and methyl alcohol were obtained. and apparently in the same relative proportions as when an excess of alkali had been used.

---

* The original distillate was always alkaline owing to the presence of a trace of ammonia, doubtless derived from a small amount of protein material present as an impurity in the pectin. It was neutralised before fractionation.

The action of pectase on pectin.—A quantity (13g.) of pectin was dissolved in 2 litres of water, a few grams of precipitated calcium carbonate added, and then 40 cc. of pectase solution introduced. This was prepared by pounding fresh clover in a motor with a little water and then expressing the liquid from the resulting mass. On keeping over night the whole mixture set to a jelly. The latter was broken by vigorous shaking and distilled in a current of steam. On fractionating the distillate it was found to contain acetone and methyl alcohol to the same extent as if the pectin had been distilled with alkali.

The contents of the distillation flask were then filtered, and the filtrate concentrated to a small bulk under diminished pressure and precipitated with alcohol. A small quantity of an amorphous solid was thus obtained, which was not unchanged pectin, but probably represented impurities in the original sample of pectin used, whilst the filtrate from this amorphous solid contained only a very small amount of material, largely dextrose, which was doubtless derived from the clover extract which had been added. Pectin, when treated with pectase in the presence of chalk*, therefore appears to yield only acetone, methyl alcohol and the gelatinous solid which consisted of calcium pectate, as shown below. The action of the enzyme, pectase, on pectin is therefore precisely analogous to that of sodium hydroxide, since the latter has been shown to convert pectin into acetone, methyl alcohol, and sodium pectate.

The solid particles of jelly which had been separated by filtration from the liquid in the distillation flash were macerated in the cold with dilute hydrochloric acid, the mixture filtered and the solid washed until free from calcium. After treatment in solution as sodium salt with animal charcoal the acid was reprecipitated washed, dried in a vacuum and analysed. Found: C = 39·2, H = 5·1, NaOH neutralised = 20·86%. Pectic acid prepared by the action of sodium hydroxide in the cold on pectin gave C = 39·4, H = 5·1, NaOH neutralised = 20·90%.

Pectin from other sources.—In order that the pectin from plants belonging to different Natural Orders might be compared with the product from apples, carrots, turnips and mangold wurzels were investigated. It was then found that the pectin from each of these sources behaved like that from apples when treated with pectase or with alkali, yielding in each case both acetone and methyl alcohol. The product obtained from mangold wurzels, however, was obviously much less pure than apple pectin, and yielded quite an appreciable amount of ammonia when distilled with alkali.

---

* Chalk was added since the presence of free acid retards the action of pectase.

THE CHEMISTRY OF THE APPLE.

(*Frank Tutin.*)

In addition to the foregoing work on pectin an examination of the other constituents of the apple is in progress, and the results of a preliminary estimation of various products present in the seeds, peel and pulp respectively are given below. The variety of apple used was the cider apple, Royal Wilding. The products estimated were: (*a*), the fat (soluble in light petroleum); (*b*), the material soluble in either, but insoluble in petroleum and in water; (*c*), the material soluble only in alcohol; (*d*), substances soluble in both alcohol and water, and (*e*), the pectin. These various products are being separately investigated, and a number of crystalline substances not hitherto recorded as constituents of apples have already been isolated. The percentages of the various products, calculated both on the fresh and the dry material, are given in the following table :—

	FRESH MATERIAL.			DRY MATERIAL.		
	SEEDS.	PEEL.	PULP.	SEEDS.	PEEL.	PULP.
	%	%	%	%	%	%
Water	27·93	76·26	79·27	—	—	—
Fat	17·58	0·54	0·06	24·47	2·31	0·31
Ether soluble product	1·19	0·94	0·06	1·66	3·97	0·27
Material soluble only in Alcohol	Small amount.	0·31	Trace.	Small amount.	1·31	Trace.
Material soluble in Water and in Alcohol ..	3·51	14·55	17·26	4·96	61·27	83·18
Pectin	None.	2·61	1·39	None.	11·00	6·70

LEAF SCORCH ON FRUIT TREES.

(*B. T. P. Barker, A. H. Lees, T. Wallace and S. P. Wiltshire.*)

In the Annual Report of this Station for 1913 a short note describing the action of wind in producing scorching of the foliage of apple trees was included. It was shown there that in the course of leaf movements caused by wind a considerable amount of rubbing of leaf surfaces takes place, resulting in changes occurring at the chafed parts which ultimately end in scorching effects. A further article in the Annual Report for 1916 deals with another aspect of apple leaf scorch, the trouble there considered being associated with certain soils, which will be referred to subsequently for convenience as "scorching" soils. The investigations at that time did not reach a final conclusion and, therefore, as opportunity arose subsequently, further observations and experiments have been made. Until 1921 circumstances did not permit of the carrying out of any extensive scheme of work. During the latter year, however, so much additional information has been gained that, although supplementary experiments in certain directions are still necessary. it is desirable to report progress and summarise the position now reached.

The scorching of foliage is not confined to apple trees. It appears, as will be shown, on fruit trees generally and on many other trees, shrubs, and even herbaceous plants. It is also evidently brought about by a variety of conditions, to which passing mention, at least, will be made in due course. A number of papers bearing on various aspects of the subject have previously been published by different investigators. One of the most recent, that by L. A. Boodle, in the Journal of the Ministry of Agriculture, August, 1920, on "Scorching of Foliage by Sea Winds," may be specially mentioned, since it includes a review of previous work and deals mainly with a side of the question, viz., the direct action of drying winds, which has not been conspicuous in our own work. Other references to the literature of the subject can be more suitably made during the course of the account of our investigations which follows.

At the outset a description of the observations made by direct examination in the field on scorching associated with scorching soils will be given. This involves to some extent a recapitulation of data already published in the paper in the Annual Report for 1916, in order to make the present account more comprehensive and complete.

DESCRIPTION OF DISEASE IN THE FIELD.

Plantations suffering from the disease can usually be picked out at some distance. There is a general brownish tinge of the foliage, as opposed to the healthy green of normal plantations. A closer view of the trees shows that affected trees are more or less stunted in comparison with healthy ones. The amount of stunting varies, in some cases it is hardly evident, whilst in others it is so excessive that trees 15 years old are only as large as normal trees of five. The length of shoot tends to be small, and in the extreme cases not more than half an inch of shoot growth may be made every year. It is, however, the leaf character that is the most obvious sign of the disease. Affected leaves appear to have their margins scorched as if by fire. In fully developed specimens the scorched margin may extend to as much as half an inch in width, leaving only a small axial portion still green. The scorched margin is dark brown in colour, and of a dry shattery texture. The full development of the scorch is usually confined to the older leaves though signs of attack may usually be seen in the younger leaves as yellowish green areas round the margin. As the leaves get badly attacked they show a great tendency to fall. The incidence of the disease usually synchronises with the advent of dry summer weather, from the end of May to the end of June, though it is not necessarily confined to this period. After this dry period has passed and summer rains have occurred the trees often make a fresh growth, which remains healthy and shows no sign of scorch. If the whole season is moist scorch either fails to develop on typical scorch plantations, or, it is very much reduced in intensity. Occasionally trees may be found which develop a comparatively sudden attack late in the summer, and a somewhat similar form is often seen in the autumn, just prior to leaf-fall. These two forms, however, are not typical, and do not cause any serious damage to the trees.

While the more obvious damage is shown by the aerial part of the tree, the roots of leaf scorch trees are also suffering. This is apparent if the trees are swayed to and fro, when, in nearly every case, the root proves to have but a poor hold on the soil.

The disease is most frequent on arable plantations and its presence on apples grown in grass is rare. Scorch cases on grass are, however, not altogether unknown, though the intensity is not then very great. The influence of root-stock is well marked, though to some extent this is confused in the field by the fact that trees in grass orchards are nearly always on the free stock, and that standard trees are not so common in arable orchards as are bush trees. Cases have, however, been seen where bush trees on free stock have shown a freedom from the disease, whereas those on Paradise in the same field were badly attacked. Similarly cases have been seen where standard trees on free stock, grown in an arable plantation, have been scorched. There is little doubt, therefore, that on the whole, both the free stock and the presence of grass tends to prevent the disease.

In most affected plantations the intensity of disease varies from place to place. Usually there are no really well defined areas of scorch, with sharply marked margins. Seen from a distance a scorched area might be picked out as contrasting with an unscorched one, but a closer view generally shows that on the margin of such areas there are trees which show a small amount of the disease which is unnoticeable except on a close view. As a general conclusion, therefore, it may be stated that the disease occurs in patches of various sizes, but that these patches have no sharp outline, but pass almost insensibly into the normal.

While the disease is most commonly reported on apples, many other kinds of fruit may suffer. It has been found also on plums, pears, red currants, black currants, gooseberries, apricots, many forest trees, as well as on vegetables, such as broad bean, runner bean, mangolds, and rhubarb.

DETAILS OF CASES IN THE FIELD.

The disease has appeared in many soils of the west and south-west. One if the first reported cases appeared on the river gravels overlying Lower Lias, in Worcestershire. Here both Worcester Pearmain and Grenadier were attacked. The latter were grubbed, but the former were allowed to remain, and have suffered every year for a number of years. The disease did not reach its full intensity, but the stunting conditions were developed sufficiently to force the trees into abundant flowering without a corresponding set of fruit.

Cases A, B, and C* are a group of plantations all of which show scorch to some extent. The soil type is similar to the first case quoted, though rather more marked in its characters. These soils are all coarse textured and full of round pebbles.

In Case B most of the commercial dessert and culinary varieties were represented, and the scorched area was fairly definite, though isolated affected trees occurred in other portions of the plantation.

In Case C the influence of the underlying clay was particularly interesting. The plantation is on a slope, and towards the bottom the lias clay comes to the surface. The line of junction of the light and heavy soil is, of course, not sharp, owing to the mixing that has taken place from rain action. On the plantation all the trees were supposed to be on the free stock and no definite scorch area could be observed, the affected trees occurring at intervals over the plot, but only on that portion which was on the lighter type of soil. The variety most affected was Lord Grosvenor, and these were growing adjacent to Newton Wonder, which showed no scorch at all. This plantation differed from others in this group in that none of the trees were badly stunted.

---

* Cases marked with letters are afterwards treated in greater detail in the portion dealing with the soil characters.

Case E.—This plantation consisted of Worcester Pearmain, Cox's Orange Pippin, James Grieve and Rival. All were on the Paradise stock and all were scorched, the Cox and Worcester bushes being the worst. They were planted in late 1919 and early 1921, the 1919 trees being allowed to fruit in 1920. All were quite loose in the soil when shaken. The surface soil was of a light stoney character and varied in depth over the plot. At the north end it was as shallow as 4 inches, but increased to 12 inches depth at the south end. The subsoil of the whole plot appeared to be of a gravelly nature. The trees on the shallow soil were affected to a greater extent than those on the deeper soil.

These cases, A—E, were all light surface soils, and it is particularly in this class that the disease is likely to appear. Before passing on to cases on medium loams, one more case will be described. This was investigated some years ago and no soil data are available other than those obtained from a purely superficial view. This case was particularly interesting by reason of the many soils and subsoils involved.

The varieties included most of the ordinary commercial ones, even Bramley, and they all showed scorching when grown in the scorch patches. These scorch patches were particularly noticeable on the shallower portions. As the depth increased scorching became less and less marked. On one side of the plantation there was a foot of peat over an inch of stiff clay, over a fairly gravelly subsoil. A little way off the soil was a peaty loam over a calcareous gravel that was nearly as hard as a pavement. Still further, the soil was a light gravelly loam over pure gravel. On all these situations trees scorched, the disease being especially bad over the gravelly portions. The most interesting fact, however, about this case was the behaviour of a standard tree, of which there were a few amongst the bushes. The stem of the tree had been bored and destroyed by Goat Moth, and, in consequence, the whole head had been destroyed. Dormant buds, however, below the injury, but still on the scion, had been forced into growth, and these had reformed a bush. This bush never scorched, though on a scorch patch. Here the influence of the free stock was clearly shown.

The next two cases appeared on soils that would ordinarily be described as medium loams.

Case F.—This plantation consisted chiefly of bush trees on the paradise stock. The disease was worse over one large patch, but was not confined to it. The trees were regularly manured in winter with watery extract of cow manure, and bore large green leaves, which were nevertheless markedly scorched. Black currants growing in the scorched area were also strongly scorched. In some positions onions showed the bad conditions through the sickly appearance of the foliage, though in their case no actual scorch was produced. Standard apples on grass near by were unaffected, but one standard tree in arable land was scorched.

Case G.—This case occurred on a medium loam, with nothing to suggest leaf scorch conditions. The trees were about ten to fifteen years old, half standards, and of the usual commercial varieties. They were markedly loose in the soil.

Case H.—This consisted of two plantations, each several acres in extent and each on a deep heavy loam soil. Though the plantations were only separated by a windbreak the scorching was confined to one. In both cases the trees were on paradise stocks, and included most of the ordinary commercial dessert and culinary varieties. The affected trees on the scorch plot varied greatly, some had made scarcely any growth since they were planted, whilst others were almost normal size for their age. All the affected trees showed the characteristic looseness on being shaken, which denotes bad root formation. The soils of both plots appeared to be identical in appearance, and the field examination did not bring out any difference. The grower who has spent much time in attempting to discover some point of difference between the two soils, has failed to do so, either in appearance or in working. Both plots have received the same manurial treatment. Previous to planting the trees good crops of cereals had been grown on the plots.

Case I.—This plantation was on a rather heavy loam, which becomes very sticky in winter, and approximates to a clay in general appearance. It would be described as a deep heavy loam. The usual effects of the disease were observed.

Case J.—This plantation is about five acres in extent. The scorch area is largely confined to about an acre in it. The grower has observed that the scorch had first appeared on the trees in the centre of this area, when the trees were quite young, and that the area had gradually extended radially, the trees in the centre being affected to a greater extent than those nearer the outer edges. The trees are now 20 years of age, and in the centre of the area some of the trees are only about four feet in height, while those slightly affected are almost normal in size. On the intermediate and smallest trees the leaves are below normal size. All are on the

Paradise Stock. The soil has the appearance of a deep heavy loam, and there is nothing in its appearance to suggest that it would be unsuitable for fruit growing. The trees in the centre of the patch are Cox, Worcester and Bramley, the Cox trees being in the worst condition.

General Conclusions from the Field Examination.

(*a*) Scorched trees are more or less stunted in growth.
(*b*) Scorched leaves may be either large or small.
(*c*) The roots of scorched trees are nearly always loose in the ground.
(*d*) Scorching takes place during the summer drought.
(*e*) That in a moist season it is nearly, or quite, absent.
(*f*) That a second growth free from scorch usually occurs after heavy summer rain.
(*g*) That scorching is usually, but not entirely, confined to light soils.
(*h*) That scorch areas generally occur in fairly, but not sharply, defined patches.
(*i*) That apples on free stocks very rarely suffer from scorch.
(*j*) That apples on grass land very rarely suffer from scorch.
(*k*) That beside the apple, plums, pears, gooseberries, black and red currants and apricots, suffer.

THE CHARACTERS OF SCORCHING SOILS.

The two characteristic features of trees suffering from leaf scorch, viz., the looseness of the trees in the ground and the scorched appearance of the leaves, are suggestive of poor root development and of the failure of water supply to the leaves.

Observations made in the field on the soils of the leaf scorch areas showed that in the majority of cases the soils were of a light, sandy character, and were often very stony. In a few cases the soils appeared to be fairly light loams of less coarse texture than those mentioned above, whilst another group appeared to be heavy loams of good depth and very similar to each other, which were decidedly " sticky " in wet weather, and difficult to work.

From the consideration of the above observations, it was thought that the examination of the textures of the soils from the scorch areas down to a depth of a few feet might throw considerable light on the problem, and the plan of work outlined below was accordingly followed.

Whenever it was possible to do so, holes were dug at various points on the scorch plots, generally about 4ft. or 5ft. in depth, or until some well defined change in the texture of the soil was met with. Soil samples for analysis were taken from the sides of these holes as follows :—Surface soil to 9ins. in depth ; subsoil between 9in. and 18in. in depth ; samples below a depth of 2ft. at intervals of 1ft. down to the bottom of the hole.

Complete analyses—mechanical and chemical—were to be carried out on the surface soil and subsoil samples, and mechanical analyses only on the samples below the subsoil.

Further, the growers were to make observations on the amount of water present in the holes during the summer.

Where it was impossible to have these holes dug, samples of the surface soil and subsoil only were taken for analysis. The results of the analyses, as far as it has been possible to complete them up to the present, are given on Page 204, and are discussed in detail below.

The examinations were carried out at 10 centres, denoted below by the letters A to J.

Discussion of Results.

Centres A, B, C.—Geological Formation—" Drift " over Lower Lias.

These three soils belong to the same deposit of " Drift " and are so similar in character that the complete scheme of analysis was only carried out on what appeared to be the most extreme case of the three, the results of the determinations of the stones, fine gravel and coarse sand, moisture and loss on ignition only being given for the second centre, and no results for the third on which the trees are the least affected.

Holes were dug at Centres A and B. At Centre A the surface soil type persisted to a depth of 6ft., at which depth a bed of blue Lias clay was found.

Throughout the summer, water lay in these holes to a depth varying from 6ins. to 18ins. from the bottoms of the holes.

The holes at Centre B were dug to a depth of 4ft, at which depth the soil sample taken appeared to indicate the point of junction of the Drift deposit with the underlying bed of clay. As these holes were only dug at the end of August, no observations were made on their water contents.

With regard to the soil at Centre C it should be stated that this centre is situated near the edge of the Drift deposit and at one end of the plantation the Drift shades off and the Lias clay underlying it appears on the surface. The leaf scorch area is situated at the point where the Drift deposit is deepest.

Centre A.—The mechanical analyses show that down to a depth of 5ft. the soil is composed largely of stones (pebbles) and coarse sand, the former composing 48 per cent of the soil at 3ft.—4ft. in depth, whilst the amount of the latter varies from 51·69% in the surface soil (after the removal of the stones) to 80·72% at a depth of 4ft.—5ft.

The percentage of clay at the various depths is always small, and at 2ft.—3ft. is only 3.28%.

The chemical analyses show a fairly low amount of organic matter present, a low total potash, and high amounts of total and available phosphoric acid in both the surface soil and subsoil.

This plot is used for growing market garden crops, and in the past heavy dressings of shoddy, bone manures, and meat meal have been applied.

The amounts of calcium carbonate present in the surface soil and subsoil are small, whilst the soil below the subsoil is devoid of this substance.

Centre B.—A comparison of the amounts of stones, fine gravel and coarse sand in the samples from this centre with those from Centre A show the following facts.

The soil at Centre B is not so stony as that at Centre A.

The amounts of fine gravel and coarse sand in the surface soil and subsoil at the two centres are practically identical, but at depths below 2ft. the amounts of these fractions present are much higher at Centre A than at Centre B.

The amounts of organic matter present in the surface soils and subsoils at Centre A are higher than at Centre B.

For consideration with these facts it should be stated here that the amount of leaf scorch present at Centre A is greatly in excess of that at Centre B.

Details of the past manurial treatment are not available for this centre.

Soils of the type occurring at these centres would be expected to have poor water-holding and water-lifting properties.

Centre D.—Geological formation—Alluvium over Lower Lias.

This soil forms part of an alluvial deposit of sand. Holes were dug at this centre, and samples taken according to plan to a depth of 5ft.

The mechanical analyses of the fractions show that the soil is devoid of stones, and that to a depth of 4ft. the dominating fraction is coarse sand, the amount of which varies from 51·86% in the surface soil to 68·33% at 3ft.—4ft. At a depth of 4ft.—5ft. a bed of blue Lias clay is reached, and the amount of coarse sand present is greatly diminished.

As in the cases of the soils at Centres A, B and C, one would expect a soil of this type to have very poor water-holding and water-lifting properties.

The food supplies in this soil are relatively small. The amounts of both total and available potash are low, whilst the total phosphoric acid is only fair and the available phosphoric acid only moderate.

Calcium carbonate is present in small quantities in the surface soil and subsoil, while the sample taken at a depth of 3ft.—4ft. contained 13·4% of this substance. The presence of this large amount of calcium carbonate in this sample may possibly be due to the continued washing down of this material through the coarse textured soil above to the point where its further downward movement would be greatly impeded by the bed of clay lying immediately below.

Centre E.—Geological formation—New Red Sandstone—Keuper Marl.

The soil of this plot is typical of a large area of the New Red Sandstone soils occurring in the district in Somerset, between Minehead and Watchet. It is on the light side and the surface soil contains numerous small flat pieces of sandstone. On digging down, these pieces of sandstone become more numerous until at a depth of a few feet the soil appears to consist almost entirely of stones.

Holes were dug on this plot to a depth of 4ft. and the usual samples taken to this depth. On the day when the samples were taken—October 28th, 1921—the soil, even at a depth of 4ft, was perfectly dry, and the soil on the sides of the holes at any depth could be removed by the hand with the greatest ease. On such a soil as this, one would expect that the trees would have some difficulty in becoming firmly established.

From the mechanical analyses, it will be seen that the percentages of stones in the samples vary from 22·8% in the surface soil to 35·4% at a depth of 3ft.—4ft. Further, the percentages of fine gravel and coarse sand are also high, amounting to 24·07% and 20·32% respectively at a depth of 3ft.—4ft.

The percentage of fine silt present is high in all samples.

From the chemical analyses, it will be seen that the amount of organic matter present in the surface soil is normal for a pasture soil of the New Red Sandstone Formation. The amounts of total potash are only medium in the surface soil and subsoil, while the supplies of available potash are only moderate. The amounts of total and available phosphoric acid present in both the surface soil and subsoil are very satisfactory.

It is evident from the percentages of calcium carbonate present in the surface soil and subsoil that the land has been given liberal dressings of lime in the past.

Centre F.—Geological Formation—Midford Sands.

The soil of this plot is a sandy loam of a fairly easy working character.

Up to the present, it has not been possible to visit this plot for the purpose of taking soil samples, but samples of the surface soil and subsoil were taken by the grower and forwarded to us.

The results obtained in the mechanical analyses of the two samples are very interesting and suggestive, and it is felt that this soil should be examined at depths below 18 inches.

It will be seen that the soil is devoid of stones and that in the surface soil the only fraction present in any considerable amount is the fine sand fraction. In the subsoil, this fraction is again the predominating one, whilst the percentage of clay is practically twice as great as in the surface soil. When viewed under a microscope, the grains of fine sand are seen to consist of flat angular plates of a highly siliceous character.

The chemical analyses bring out the following points :

The amounts of organic matter present in the surface soil and subsoil are small.

The amounts of total potash are low in both samples, whilst the available potash is only moderate in the surface soil, and is low in the subsoil. The soil is well supplied with phosphates, and has, apparently, received heavy dressings of lime in the past.

Centre G.—Geological formation—Old Red Sandstone near junction with Wenlock Limestone.

The soil at this centre is on the light side, and works easily. Holes were dug on the plot to a depth of 3ft.—4ft., and an examination of the soil at the various depths in these holes showed that there was a sharp change in the soil texture at a depth of 18 inches from the surface. The soil below this depth contained numerous large pieces of sandstone, which appeared to indicate the presence of a sandstone bed below. There is a sandstone quarry at a short distance from this leaf scorch area, where the sandstone rock is seen to lie at only a small depth below the surface level.

The mechanical analyses of the surface soil and subsoil samples give results which are typical of the lighter soils of the Old Red

Sandstone Formation, and give no indication of the soil being other than normal for this type. An examination of the soil below 18ins., however, showed that below this point the soil differed in character from the soil above. It contained a considerable quantity of large pieces of calcareous sandstone. The actual percentage of these present in a given sample was not determined as they were too large to allow of a sample being taken in the usual way. Samples of these stones and samples of the soil between the stones, were taken for laboratory tests. All the stones examined were found to contain a high proportion of calcium carbonate, and they probably consisted largely of Wenlock Limestone. The mechanical analysis of the soil sample taken is given in the table. The texture is still typical of an Old Red Sandstone soil, but the sample was found to contain 12·82% of calcium carbonate.

The results of the chemical analyses of the surface soil and subsoil are typically those of an Old Red Sandstone soil.

The percentage of organic matter—7·46%—is usual for pastures on this type of soil (this plantation was an old pasture until a few years ago), the total potash is higher in the surface soil than in the subsoil, being fairly high in both, whilst the amounts of available potash are low in both samples. The percentages of total and available phosphoric acid are fairly good in the surface soil and are low in the subsoil.

The soil had been limed recently and had been given liberal dressings of manures, such as meat meal, slag, superphosphate, etc.

On this plot it is possible that the development of the roots of the trees might be restricted by the stony layer underlying the subsoil.

Centre H.—Geological Formation—Old Red Sandstone.

At this centre, the soils of two adjoining plantations were examined. In one of the plantations almost all the trees were affected with leaf scorch, whilst in the other none of the trees showed any signs of scorching.

The soils were identical in appearance, both being heavy loams belonging to the Old Red Sandstone system. Samples of the surface soil and subsoil were taken from each plot and mechanical and chemical analyses have been carried out on all the samples.

Sample from Leaf Scorch Plot.

The chief points brought out by the mechanical analysis of the surface soil are that the soil contains no stones, the amounts of fine gravel and coarse sand are very small, the middle fractions of the soil—fine sand, silt and fine silt—are present in large proportions, together comprising 75·86% of the soil, whilst the amount of clay present is below what one would expect it to be from observations made in the field.

The subsoil is similar in texture to the surface soil, but there is one difference which may be of great importance, viz., the amount of fine sand present in the subsoil is 40·37%, being approximately 14% above the amount of fine sand present in the surface soil. The amounts of silt, fine silt and clay in the surface soil are all greater than those present in the subsoil.

The chief points of note in the chemical analyses of the samples are as follows :—

The amounts of organic matter present in the samples are small.

The total potash in each sample is high, being slightly higher in the subsoil than in the surface soil.

The percentages of available potash are low in both the surface soil and in the subsoil.

Total phosphoric acid is present in fair quantity in the surface soil and is low in the subsoil.

The amounts of available phosphoric acid in both the surface soil and subsoil are high and the land has evidently received heavy dressings of phosphatic manures.

Calcium carbonate is present in small quantity in the surface soil and is absent from the subsoil.

The plot has not been limed of recent years, and is naturally deficient of lime.

Samples from No Leaf Scorch Plot.

The mechanical analysis of the surface soil of this plot shows the texture to be almost identical with that of the surface soil of the leaf scorch plot. When we examine the results obtained for the subsoil of this plot, however, it is seen that these results differ from those obtained for the subsoil of the leaf scorch plot. The amount of fine sand present in the subsoil of this plot is only 3% above the amount present in the surface soil, whilst the amounts of silt and fine silt are only slightly below those present in the surface soil and the amount of clay present is higher. The gradation shown between the textures of the surface soil and subsoil of this plot would appear to be fairly normal in character.

The results obtained in the chemical analyses of these samples are of the same order as those obtained for the samples from the leaf scorch plot, and the differences obtained, no doubt, are due to slight differences in the manurial treatments given to the plots.

Centre I.—Geological Formation—Old Red Sandstone.

The soil of this plot is very similar in appearance to the soil of the plots at Centre H, and this similarity of texture is brought out by a comparison of the mechanical analyses of the soils of the plots.

The mechanical analyses only of the surface soil and subsoil at this centre have been carried out.

A comparison of the results obtained for the surface soil and subsoil shows that the relation existing between these is very similar to that found in the case of the leaf scorch plot at Centre H, viz., the amount of fine sand present in the subsoil is 8.48% above the amount present in the surface soil, and the same relation exists between the amounts of silt and fine silt present in the two samples.

The amount of clay in the subsoil at Centre I is greater than the amount present in the surface soil, which is a point of difference from the leaf scorch soil at Centre H.

Centre J.—Geological Formation—New Red Sandstone, Keuper Marl.

A hole about 7ft. in depth was dug at this centre for the purpose of making observations on the water supply during the season. An examination of the soil on the sides of this hole showed that the soil was of great depth, and even down to a depth of 7ft, there was no marked change visible, the soil merely appearing to become gradually of a more clayey nature after a depth of 3ft. was reached. Apparently there could be no question of the leaf scorch occurring on this plot being due to lack of depth of soil.

The observations on the supply of water in the hole were not made very frequently owing to pressure of work, but on the two occasions on which the plot was visited by one of us, in June and September, there was no water in the hole on either occasion.

Soil samples were taken to a depth of 5 feet at this centre, and the results of the analyses of these are given in the table.

Although the soil of this plot belongs to a different geological formation from the soils at Centres H and I, the surface soil and subsoil of the plot are remarkably similar in texture to those soils. Here again, the dominant fractions of both surface soil and subsoil are fine sand, silt, and fine silt. The percentage of the last of these is remarkably high in the surface soil. The percentage of fine sand in the subsoil is 8% above the amount in the surface soil, and this percentage is almost maintained in the 2ft.—3ft. sample.

The percentages of the middle fractions present fall in the 3ft.—4ft. sample, where the percentage of clay rises sharply.

The results of the chemical analyses of the surface soil and subsoil samples may be summarised as follows :—

The percentage of organic matter present in the surface soil is higher than at Centre H, as the plantation is at present " down " to grass.

The amounts of total potash in the surface soil and subsoil are high, the amount in the former being higher than in the latter.

The amounts of available potash are low in both samples.

The total phosphoric acid is only moderate in amount in the surface soil, and is low in the subsoil.

The available phosphoric acid, like the total phosphoric acid, is moderate in amount in the surface soil, and in the subsoil it is very low.

The amounts of calcium carbonate present in the two samples are indicative of the applications of lime to the soil in the past. The samples taken below 18 inches were devoid of lime.

Summary of Results.

The noteworthy results of the analyses are summarised below, and for the purpose of bringing out more clearly the points of similarity between certain of the soils, the soils showing important features in common have been grouped together for discussion.

Centres A, B, C, D.—These are all light, sandy soils of the market garden type. The dominant fraction is coarse sand. In addition, the soils at Centres A, B and C contain high percentages of stones.

Chemically these soils contain poor potash supplies, and whilst the soil at Centre A at present contains a large supply of available phosphoric acid, the soil at Centre D is relatively deficient of this constituent.

The soils at Centres A. B and C are also naturally deficient in lime.

Centre E.—The dominant feature of this soil is its extremely stony character, and at a depth of 3ft.—4ft. the soil resembles a gravel pit.

The supply of potash is only moderate, whilst the supplies of phosphoric acid and lime in the surface soil and subsoil are good.

Centre F.—The chief characteristics of the texture of this soil are the high percentages of the fine sand fraction present in both the surface soil and subsoil, and the lack of stones, fine gravel and coarse sand in the soil. The percentage of clay in the subsoil is twice as great as in the surface soil.

Chemically the soil is lacking in organic matter,and thes upply of potash is on the small side.

LEAF SCORCH SOILS—MECHANICAL ANALYSES.

	Centre A.	Centre B	Centre D	Centre E	Centre F	Centre G	Centre H *	Centre H †	Centre I	Centre J
Surface Soils :—										
Stones	26·0	14·5	Practically nil	22·8	Practically nil	8·8	nil.	nil	4·39	1·0
Moisture ..	1·76	1·33	2·37	2·76	1·96	1·90	2·40	2·47	2·75	3·27
Loss on Ignition	5·09	3·58	6·04	7·80	4·94	7·46	4·26	4·64	7·07	8·14
Fine Gravel ..	3·61	3·38	0·54	7·26	0·68	2·09	0·61	1·05	1·7	2·23
Coarse Sand ..	51·69	52·80	51·86	11·71	0·99	3·34	3·32	4·28	4·48	3·40
Fine Sand ..	17·09	..	16·80	19·04	59·67	36·10	26·41	26·58	31·98	21·78
Silt	5·24	..	6·49	13·03	9·34	19·90	26·53	25·95	22·21	22·12
Fine Silt ..	7·72	..	7·34	28·12	6·97	19·81	22·92	21·60	18·23	26·30
Clay	6·38	..	8·66	5·58	9·36	7·73	12·57	12·25	9·81	10·57
Subsoils :—										
Stones	30·0	16·3	nil	28·1	..	nil	nil	nil	4·4	4·5
Moisture ..	1·56	1·30	1·76	2·00	2·75	1·40	2·47	2·30	2·08	1·96
Loss on Ignition	3·55	3·58	3·30	4·58	4·08	3·76	3·12	3·42	4·31	2·92
Gravel	4·56	2·82	1·35	8·26	nil	4·66	0·46	0·47	1·34	3·57
Coarse Sand ..	52·92	52·50	51·14	11·71	0·38	4·00	1·21	3·09	5·08	3·73
Fine Sand ..	17·90	..	16·26	19·22	55·91	38·57	40·37	29·58	40·38	29·99
Silt	4·77	..	5·65	11·85	10·03	21·85	21·83	23·21	18·85	20·48
Fine Silt ..	6·95	..	7·16	30·52	8·18	16·85	18·75	21·53	15·49	23·50
Clay	6·84	..	12·32	11·07	17·50	7·90	10·79	15·21	11·59	12·64
2ft.—3ft. :—						‡				
Stones	24·7	15·2	nil	25·3		Num. cal. sandstones				2·0
Moisture ..	..	..	1·50	1·63		..				..
Loss on Ignition	..	..	2·84	3·28		..				..
Gravel	6·43	2·76	0·56	18·01		3·02				2·50
Coarse Sand ..	68·18	46·02	61·65	12·78		3·85				4·35
Fine Sand ..	13·24	..	11·69	17·04		33·99				28·28
Silt	2·94	..	3·29	9·41		19·17				17·97
Fine Silt ..	2·16	..	3·87	26·89		13·38				21·36
Clay	3·28	..	13·76	10·29		11·61				19·35

3ft.—4ft. :—							
Stones	48·0	26·7	nil	35·4			nil
Moisture ..	..	..	0·36	1·14			..
Loss on Ignition	..	..	2·41	3·52			..
Gravel	11·62	5·20	4·21	24·07			nil
Coarse Sand ..	59·36	29·32	68·33	20·32			1·39
Fine Sand ..	8·04	..	9·45	16·52			18·14
Silt	2·59	..	1·10	7·93			15·31
Fine Silt ..	3·19	..	1·01	19·09			20·78
Clay	9·89	..	0·90	7·23			37·01
4ft.—5ft. .—							
Stones	18·40	..	nil	..			nil
Moisture ..	..	..	2·92	.			..
Loss on Ignition	..	..	5·36	..			..
Gravel	5·32	..	0·44	..			nil
Coarse Sand ..	80·72	..	16·59	..			0·62
Fine Sand ..	3·23	..	7·36	..			15·12
Silt	0·72	..	10·07	..			17·42
Fine Silt ..	0·42	..	12·93	..			19·35
Clay	6·55	..	28·78	..			39·60

* Leaf Scorch Soil. † No Leaf Scorch. ‡ Between 18ins. and 4 ft. Numerous calcareous sandstones.

LEAF SCORCH SOILS—CHEMICAL ANALYSES.

	Centre A	Centre D	Centre E	Centre F	Centre G	Centre H *	Centre H †	Centre J
Surface Soils :—								
Moisture	1·76	2·37	2·76	1·96	1·90	2·40	2·47	3·27
Loss on Ignition ..	5·09	6·04	7·80	4·94	7·46	4·26	4·64	8·14
Potash (Total)	0·279	0·292	0·472	0·314	0·666	0·846	0·744	0·741
Potash (Available) ..	0·0181	0·0071	0·0117	0·0133	0·0106	0·0109	0·0129	0·0086
Phosphoric Acid (Total)	0·326	0·141	0·195	0·313	0·160	0·140	0·161	0·125
Phosphoric Acid (Available)	0·140	0·0116	0·0273	0·0916	0·0296	0·0599	0·0729	0·0144
Calcium Carbonate ..	0·270	0·138	2·51	5·52	0·366	0·120	0·060	1·026
Lime Requirement ..	nil	nil	nil	nil	nil	nil	nil	nil
Subsoil :—		2nd Foot.						
Moisture	1·56	1·76	2·00	2·75	1·40	2·47	2·30	1·96
Loss on Ignition ..	3·55	3·30	4·58	4·08	3·76	3·12	3·42	2·92
Potash (Total)	0·243	0·140	0·520	0·437	0·586	0·853	0·807	0·698
Potash (Available) ..	0·0130	0·0046	0·0107	0·0098	0·0065	0·0058	0·0060	0·0058
Phosphoric Acid (Total)	0·238	0·108	0·167	0·214	0·0909	0·0661	0·0571	0·0668
Phosphoric Acid (Available)	0·101	0·0043	0·0264	0·0384	0·0057	0·0223	0·0101	0·0043
Calcium Carbonate ..	0·151	0·076	0·181	0·469	0·048	nil	0·037	0·053
Lime Requirement ..	nil	nil	nil	nil	nil	0·119	nil	nil
18*ins.*—4*ft* :—								
Calcium Carbonate ..					12·82			
Lime Requirement ..					nil			
3*ft.*—4*ft.* :—								
Calcium Carbonate ..		13·4						
Lime Requirement ..		nil						

* Leaf Scorch Soil. † No Leaf Scorch.

The percentages of phosphoric acid in both the surface soil and subsoil are high, whilst the soil contains ample supplies of lime.

Centre G.—The textures of the surface soil and subsoil are typical of the lighter soils of the Old Red Sandstone Formation. At a depth below 18 inches from the surface, the soil contains large quantities of large calcareous sandstones, and it is possible that the rock lies at quite a short depth below this point.

The supplies of total phosphoric acid are moderate, though heavy dressings of this material have been supplied. The soil is poor in available potash, and while the surface soil and subsoil are poor in lime supplies, the soil below this subsoil contains large supplies of this substance.

Centres H, I, J.—The soils at these centres are very similar in texture. The mechanical analyses show them to consist largely of the middle fractions. The soil on which leaf scorch occurred at H, and the soils at I and J, all contain a much higher percentage of the fine sand fraction in the subsoil than in the surface soil. This characteristic is not shown to the same extent in the soil from which leaf scorch is absent at Centre H.

The textures of these soils are such that they are probably very liable to "pack," in which condition they would possibly greatly hinder healthy root development. It is possible that the presence of considerably higher amounts of fine sand in the subsoils than in the respective surface soils of these plots is indicative of a condition of packing of particles in the subsoils, resulting in the formation of a peculiar type of hard pan.

Chemically, the characteristics of these types of soils are their low contents of organic matter, their naturally large supplies of total potash, their small amounts of available potash, their poor supplies of phosphoric acid and their limeless natures.

Some of these characteristics have been altered by manuring and by other means.

FURTHER EXAMPLES OF SCORCHING.

A further instance of scorching associated with soil conditions may be referred to in some detail, since it differs in some respects to the preceding and, being at Long Ashton, has been under close observation and treatment. The land in question is now cultivated, but was down to grass until about 10 years ago. It is on a southern slope, and the depth of the soil is generally not more than from 1 to 2 feet, underlying being a bed of broken stone. A year after it was first cultivated it was planted with fruit, mainly apples, plums, gooseberries and red currants. The plums as a whole have grown well and show little scorch, but many of the apples, especially the weaker growing varieties, have failed to make much growth and show a form of leaf scorch every year. The same may be said of the gooseberries and currants which have not received special treatment. The form of scorch in this instance is not so much of the marginal and leaf tip variety as one irregularly distributed over the surface of the leaf, which generally is much undersized. Leaf discolouration begins soon after unfolding and production of new foliage and shoot growth almost ceases by midsummer. The appearance of the plants being strongly suggestive of defective nutrition, a number of them were given a heavy dose of mixed artificials (sulphate of potash, superphosphate and nitrate of soda in most instances), a moderate dressing of farmyard manure having failed to improve them materially. The response to the artificials was rapid and most striking. The treated plants have remained practically free from scorch and have made normal growth, aided only subsequently by occasional dressings of farmyard manure. One year after the application of artificials some of the treated and untreated bushes were lifted. The difference in root development was seen to be of a most striking character, those of the treated plants being many times as large as those of the untreated, which showed hardly any signs of formation of new roots.

Other experiments on land adjoining showed that the application of potash salts in combination with nitrogenous and phosphatic fertilisers sufficed to cure scorching and cause growth, while the application of nitrogen and phosphate without potash failed to do so.

On another adjoining piece of land similarly situated, which was planted with gooseberries a year ago, a similar suggestive result has been observed. Running right through the plot is a strip some 10 to 20 feet wide, which has been subject for many winters to washings by the overflow of a small adjacent pond. The bushes on that strip made practically no growth last season and the foliage was badly scorched from Midsummer onwards. Those in the rest of the plot made very good growth considering the season. It should be mentioned that the plot had received no recent manure before planting and nothing was given subsequently except sulphate of ammonia, when rains came in the latter half of July. This, like the preceding, appears to be a case of scorching due to defective nutrition on the portion of the plot subject to the overflow of water.

The shallowness of the soil in these instances is believed to have intensified the trouble, for in dry seasons the scorch has been more marked than in wet. But nutritive rather than dry soil conditions must be held primarily responsible, because scorch occurred in both dry and wet summers, and manurial treatment succeeded in checking what moisture alone failed to prevent.

In this connection attention may be called to cases of the converse order, to which reference was made in last year's Report, in the article on "Root Formation in Newly Planted Trees." A description of the behaviour of apple trees grown in water culture was given, which showed that under such conditions very poor root growth was made, in spite of the presence of an adequate supply of nutrients and water, owing to defective aeration of the root system. The foliage was poor, individual leaves being much smaller than normal and very subject to scorch. Here then a combination of nutrients in abundant supply and water produced the same kind of result as the deficiency of those materials in the previous instances, and the determining factor was evidently lack of aeration at the root, resulting in poor root growth and the consequent starvation and relative drought within the tree.

The effect of malnutrition in another form in inducing scorch was observed in a series of experiments conducted with almond trees a few years back. These were started with the idea that if the tree could be induced to absorb a sufficient quantity of a toxic salt without too serious injury to itself, the amount thus taken up might be capable of checking the development of leaf curl by direct toxic action on the fungus producing that disease, *Exoascus deformans.* The trees under treatment were grown in pots, to the soil in which different amounts of lithium carbonate were added. With the heavier dressings the trees were killed outright, but where smaller doses were applied they made some growth. The leaves in such cases, however, were more or less scorched, according to the quantity of lithium carbonate used, and the scorch was generally quite characteristic of the marginal and tip type. It is unfortunate that no examination of the root system was made in these cases, its significance not being appreciated at the time. Whether the toxic salt by restricting root growth causing direct injury to the root tissues on absorption or by producing unhealthy conditions elsewhere within the tree, there can be no doubt as to its responsibility for the scorch.

Another type of scorch familiar probably to the majority of growers of gooseberries is that associated with the "Die-back" disease of that plant caused by the fungus *Sclerotinia fuckeliana.* An account of this disease has been given in Leaflet No. 234, published by the Board of Agriculture (1914, 2nd Edition), the accompanying plates of which show the general appearance of the scorch on the foliage particularly well. It was believed earlier that the scorched margins of the leaves were caused by the presence of the fungus in the leaf tissues at those parts, but that view is thought now to be erroneous. The scorching is the result of the presence of the fungus in the vascular tissues of the plant in the main stem or a branch well below the affected foliage. It is brought about by the interference thus caused with the supply of water to the leaves above that point. There comes a time in due course when the fungal growth has increased to such an extent that the supply is cut off more or less completely. That generally happens quite early in the growing season. The foliage then, instead of scorching, suddenly wilts. This is a particularly interesting case from the scorch point of view, as illustrating that it is the degree of interference with the water supply which determines whether a general leaf wilt or scorch only takes place. It is evident that a shortage of water in the leaf can result in the latter without involving the former.

It is difficult to say whether scorch in such cases is the end result of a purely local wilt, limited to a small portion of the surface of the leaf, or whether it occurs without the tissues affected passing through a stage corresponding to wilt. Lutmann's account of Tip Burn of the potato and other plants* rather supports the former idea, but in the case of leaves of fruit trees no preliminary wilting of the parts concerned is visible to the naked eye. The conclusion of that author in the cases of scorch described in his paper is that it is due to excessive heat and sunshine, which cause inordinate transpiration from the parts directly affected and so bring about local wilting from which recovery is not made.

Scorch Production by Fires.—During the summer of 1921, a chance observation was made on the production of leaf scorch by the heat of a fire lighted in a plantation for the purpose of burning refuse.

The fire had been lighted between two standard apple trees. Some of the leaves of the tree on the side of the fire were exposed to sufficient heat to destroy them completely, whilst some were only slightly injured and others remained uninjured. It was noted that the damage done to the slightly injured leaves was entirely marginal, the damaged leaves being similar in appearance to the leaves of trees affected with leaf scorch. The damage done to the leaves of the tree on the windward side—which had not been exposed to such great heat as the tree on the leeward side—was almost entirely marginal.

---

* Lutmann: Tip Burn of the Potato and other Plants. Vermont Agricultural Experiment Station, Bulletin 214.

It is deduced from this incident that, when the foliage of a tree is exposed to temperatures just sufficiently high to cause some injury to it, the marginal areas of the leaves are the first parts to suffer.

Before passing to a description of the experimental work at Long Ashton on this problem, reference may be made to two other forms of scorching which have been reported. In the one case Wilfarth and Wimmer have shown* that in manurial experiments on sugar beet, leaf scorch occurs when the plants are deprived of potash. The other instance is the well-known one of the potato, which shows a characteristic leaf curl accompanied by scorch when the plant is insufficiently supplied with that constituent (Quanjer †)

EXPERIMENTAL WORK.

The object of all the experiments about to be described was to reproduce leaf scorch artificially under controlled conditions in order to discover the factors causing the disease.

EXPERIMENTS ON BROAD BEANS.

Water Culture Experiments on Broad Beans.

At the outset of the work one of the most likely factors to cause leaf scorch appeared to be the concentration of salts in the soil. This was tested by the growth of broad beans in appropriate culture solutions, that kind of plant being selected as especially suitable on account of its quick growth and known liability to scorch.

Experiment 1 consisted of growing beans with the following treatments :—

A Normal food solution. Control.
B1 „ „ „ concentrated 10 times.
B2 „ „ „ concentrated 50 times.
C1 Containing sodium chloride giving a concentration 20 times that of food solution.

---

* Wilfarth and Wimmer. Die Kennzeichen des Kalimangels an den Blattern der Pflanzen. *Zeitschrift fur Pflanzen-Krankheiten.* 1903.

† Quanjer. *Medederlingen van de Rijks Hoogere Land, Trein-en Roschbouwschool,* Deel x., p. 95.

C2 Containing sodium chloride giving a concentration 50 times that of food solution.

C3 Containing sodium chloride giving a concentration 100 times that of food solution.

Six plants were used for each treatment, these being grown to a convenient size in normal food solution until required. The solutions B1, B2, and C3, caused wilting in a few hours and a blackening of the roots. After a few hours, the plants in C3 solution were transferred to water, whilst B1 and B2, were allowed to stand overnight before being transferred. After five days the results of the experiment were as follows :—The control plants were quite normal. The B1 plants completely recovered although showing some blackening of the roots. The B2 plants showed the young unopened leaves untouched, the top leaves scorched at the tip, the lower leaves at the tips and between the veins. In some cases the lower leaves were completely killed. The C1 plants were normal; C2 showed slight blackening of roots and signs of scorch on one leaflet; C3 showed severe blackening of the roots, but no scorch. The results of this treatment, therefore, indicated that sudden changes from normal to 10 and 50 normal resulted in wilting, followed by scorching when the action was severe. The scorching produced, however, although somewhat similar in appearance, was not identical with that occurring naturally which developes without wilting of the foliage.

Experiment 2 with the same plants was as follows :—

A Series of the 1st Experiment remained as Control.

B1 Series which had been in water for a few days, treated with food solution twice the normal concentration.

C3 Which had been in water for a few days, treated with food solution three times the normal concentration.

C1 Which had been under continual treatment with salt solution was placed in water overnight and then in solution four times normal concentration.

C2 as C1, but placed in a food solution five times normal.

The results were not altogether regular, although scorch very generally developed. After 9 days, scorching at the margins was present in the 3, 4, and 5, normal solutions, but not in the 2 normal and control plants.

On the tenth day the control plants were put in a solution 6 times the normal, the twice normal plants with a solution 7 times the normal. Five days later, viz.: 15 days after the start of the experiment the results were as follows:—

The 6 × normal plants showed slight signs of scorch in 3 plants (two plants one leaf each and one plant with lower leaves). The 7 × normal plants showed 4 plants slightly scorched, although the scorching was more definite than with the 1 normal plants. Of the 3 × normal plants 3 scorched and 3 remained uninjured. The 4 × normal plants also showed 3 scorched and 3 uninjured and similarly the 5 × normal plants also showed 3 sorched and 3 uninjured. The irregularity of these results suggests at least that the concentration of the food solution is not the factor producing scorch.

Treatment 4.—In this case plants were grown in normal food solution to which various toxic salts (·1 grm. per 1000 cc.), were added. Copper sulphate and mercuric chloride killed the plants, causing shrivelling up of stem and leaves in general.

Treatment 5.—Root pruning of plants in water culture resulted in young leaves becoming scorched.

Pot Experiments on Broad Beans.

Experiment 1.—The object of this experiment was to determine if a limitation of the water supply is a factor in the production of leaf scorch. Analysis of the subsoil in a certain number of scorch soils had shown that the percentage of gravel increased downwards, giving a soil with a bad uplifting capacity for water. The experiment was made on the hypothesis that scorching ought not to appear if the surface soil of scorched areas were kept well watered.

The method of making the experiment was as follows:—Four different samples of surface soil taken from leaf scorch areas in the fruit plantations, D, F, G, J, were used and a fifth artificial soil was made up from 50% coarse sand, and 50% Research Station soil. Eight pots of the soils D and F and 10 pots of G, J, and the artificial soil were used. All the pots were waxed before the beginning of the experiment to make them impervious to water.

During the initial stages of the experiment the plants were raised under glass in a greenhouse. When the plants were well started, however, the following differential treatments were commenced. In the case of each type of soil the pots were divided into two lots. Half were placed in a trench, the bottom of which consisted of a layer of sifted ashes and coarse sand resting on a layer of coarse ashes, which layer rested on the normal soil. The layer of ashes was about 9 inches deep. Fine ashes and coarse sand were filled into the trench round the pots. The ashes and sand mixture in the trench was kept in a moist condition, and the plants in the trenched pots drew the whole of their water supply from the ashes mixture in the trench. The other half of the pots were placed alongside the trench and were watered from the top. The final results of the number of leaflets scorched expressed as average per pot was as follows :—

	Bottom watering. %	*Top watering.* %
D	8·75	5·25
F	·25	2·75
G	1·	·4
J	3·8	1·2
Artificial	4·4	4·6
	18·2	14·2

As far as they go these figures show that there was 28% more scorch on the bottom watered plants than on the top watered ones. The difference was not so striking as expected, and the fact that the top watered plants produced quite a definite amount of scorch, showed that watering was not the limiting factor in the production of scorch in this case.

None of the scorching soils produced such good roots as the artificial, and the root development of beans in those pots watered from the bottom, was decidedly inferior to those watered from the top. There was distinctly more blackening of the roots on the J soil than on any other, and the top watered plants were worse than the bottom watered.

The amount of top growth made by the top watered plants was distinctly greater than that of the bottom watered, each series giving consistent results in this respect.

Experiment 2.—The object of this experiment was to find (1) if increasing the concentration of the soil solution tends to produce leaf scorch and (2) if bright sunlight and shade are factors in leaf scorch production.

Twenty-five waxed pots were filled with artificial soil (50% Research Station soil and 50% sand), and broad beans—3 per pot were grown in them. The pots were then divided into 5 series of 5 pots each. The first series was watered from the beginning with a normal nutrient solution, the second with one twice the normal concentration, the third with one three times, the fourth with one four times, and the fifth with one five times.

The initial stages of the experiment were carried out in the greenhouse and the plants were moved later to the following position.

(1) One pot from each series was placed under a glass shelter, open on the sides.

(2) Two pots from each series were placed in strong sunlight in a greenhouse.

(3) Two pots from each series were placed in the same greenhouse, but were shaded by muslin.

Watering with respective nutrient solutions was continued in all the pots.

The results for experiment 2 expressed as average per pot were as follows:—

	Brilliant light. %	*Shaded.* %	*Outside shelter.* %
Normal..	4·5	1·0	4·0
2 „ ..	9·5	3·0	2·0
3 „ ..	5·0	3·5	2·0
4 „ ..	2·0	2·0	—
5 „ ..	4·0	2·5	—
Totals ..	25·	12·	8·

From these figures it appears that brilliant sunlight is favourable for the production of scorch, especially if combined with a somewhat high temperature which obtains in a greenhouse. There was no correlation, however, between the amount of scorch and the concentration of the food solution.

Examination of the roots showed that increasing the concentration of the soil solution induced less root development, and increased the blackening of the roots in each series. The series grown in the shelter had greater root development and less blackening than that grown under shade conditions in the greenhouse, which series in turn stood in like measure with regard to the unshaded. With the highest concentration a small type of leaf was developed. The outdoor plants had the best top development.

Experiment 3.—The primary object of experiment 3 was to determine if feeding with an excessive amount of nitrogen promotes the development of leaf scorch. Variations of nitrogenous feeding, therefore, were given so as to combine other possible factors with this one, to see if any such combinations produced leaf scorch. Eight pots were used in series 1, 2, 3, and 4, and ten in series 5, half containing the 50% Research Station soil and 50% sand and half containing the 10% Research Station soil and 90% sand. The plants were grown in the greenhouse and were watered with a nutrient solution containing three times the normal amount of nitrogen. When the plants were about 6-12 inches high, the following treatments were commenced :

Treatment 1.—Plants placed in the glass shelter and the feeding with nutrient solution substituted by normal top watering with rain water.

Treatment 2.—Similar to Treatment 1, but the watering was done from the bottom by placing the pots in the ashes sand trench, as in experiment 3.

Treatment 3.—The feeding with nitrogenous solution was continued, but half the plants were placed in direct sunlight and half in the shaded portion of the greenhouse.

Treatment 4.—Of the eight pots of this series, four (two of each sort of soil), were watered with justs sufficient water to prevent wilting. The remaining four received the same solution of liquid as the preceding four in the form of nitrogenous nutrient solution.

Treatment 5.—Ten pots (five of each sort of soil) were left in the shelter and the treatment with nitrogenous nutrient solution continued.

The results expressed as average scorched leaflets per pot were as follows :—

	Treatment.	50 : 50	90 : 10
1.	Top watering	5·5	2·7
2.	Bottom watering	4·0	3·5
3.	Unshaded	3·5	5·5
	Shaded	5·5	9·0
4.	Rain water to prevent wilting	8·0	6·0
	Nitrogen solution to prevent wilting	7·0	4·0
5.	Nitrogenous feeding continued	4·2	2·2

It is extremely difficult to gather any definite conclusion from these figures.

The root development was greater and less blackened in the case of the 50 : 50 soil than in the 90 : 10. The outdoor plants again showed the best roots with least blackening, the indoor shaded ones stood next and the indoor unshaded stood last of all.

Experiment 4.—One of the characteristics of trees suffering from leaf scorch is the feeble development of roots. The possibility that this might be due to bacterial action could not be ruled out and, therefore, some trials were made to see if scorch could be produced on leaf scorch soils after they had been sterilised.

The four types of scorch soil, as used in experiment 1, were used in this experiment also. The pots containing the soil were autoclaved at 15 lbs. pressure for 1 hour, and were subsequently watered with water in which normal station soil had been allowed to stand. Half the pots were watered from the top and half from the bottom, as in Experiment 1.

The results expressed as average scorched leaflets per pot were as follows :—

	Top watering.	*Bottom watering.*
D	19·0	9·0
F	8·0	5·0
G	1·5	2·5
J	5·0	2·0
	4) 33·5	4) 18·5
	8·4	4·6

From this it appears that scorch was, therefore, not influenced by sterilisation.

EXPERIMENTS ON APPLE TREES.

Experiments on Variations of Soil Moisture.

When the disease was first being investigated the idea was held that it could be produced by a gradual drying up of the soil. To test the view a number of apple trees were submitted to a drying process. They were planted in boxes of about one cubic foot capacity. In each case the weight of the tree, box and soil were ascertained and thè percentage of soil moisture determined. The experiment was divided into two parts. In one the trees were kept at constant, but different, soil moistures; in the other the soils were wet to begin with and then gradually dried off. Once or twice a week the boxes were weighed and the proper amount of water added to bring the percentage up to the correct figure. At the same time notes of the appearance of the trees were made.

The experiment failed to produce any typical case of scorch, though in one or two cases of the more severe treatments the leaves showed some browning. The discolouration was, however, general rather than marginal. Where drying up was allowed to go on fairly far the leaves produced were generally rather small and of a yellowish green colour, but showed an inclination to scorch. The experiment seemed to indicate, therefore, that drought alone would not produce scorch, but that other factors must come into play as well.

Experience in the field goes to support this supposition. In 1921, during the pronounced drought, established standard trees in gardens could be found which were so deprived of water as to have reached the wilting point, and yet no sign of scorching was apparent. Under these conditions the drying was slow and gradual, in fact just those conditions which might have been expected *a priori* to have produced scorch.

Experiments on Root Injury.

During the period of bright hot weather, which persisted practically without a break over the period from the middle of June to the middle of July, 1921, experiments were carried out on two methods of injuring the roots of apple trees, whilst the trees were in full leaf, to ascertain whether severe injury to the roots at that period of the year and under weather conditions likely to promote leaf scorch would result in its production.

Several apple trees—varieties, Bramley's Seedling and King of the Pippins—all of which were either two or three years of age, and which were growing in soil in 10 inch plant pots were used in these experiments.

All the trees were in healthy condition before the treatments were carried out.

Series A.—Root Pruning Experiments.

Trees were treated at various dates as follows :—Some of the soil was removed from the tops of the pots so as to bare the points of the stem from which the main roots branched off. Varying numbers of these roots were completely severed near their points of origin, some of the root systems being treated very drastically. The bared roots were covered again with soil and the trees given normal waterings daily and left out in the open, exposed to the sun.

There was no leaf scorch developed on any of the trees as the result of this treatment.

Series B.—Root Drying Experiments.

In these experiments, the trees, together with the soil of the pots which adhered to their roots, were removed daily from their respective pots and placed in positions where they were exposed to the direct rays of the sun. They were left in these positions for periods varying from one to four hours and then replaced in the pots. In this manner the roots were gradually dried. No water was given during the treatment. The treatment was continued with each tree—usually over a period varying from 7–10 days—until the leaves began to show signs of leaf scorch, when the tree was allowed to remain in the pot and small quantities of water given daily to prevent the tree from dying. Under this treatment the trees developed typical leaf scorch, and if only a very small quantity of water was given the scorched leaves were gradually shed. When trees had developed leaf scorch fairly extensively they were dressed with a dung mulch and kept well watered with a complete nutrient solution. Under this treatment the trees developed a new set of foliage which was healthy and free from leaf scorch.

Manurial Experiments with Apple Trees Grown in Sand.—During the season of 1921, an experiment was commenced to discover the effect of omitting the various elements of plant food from the diets of apple trees grown in sand contained in 10 inch plant pots.

Towards the end of June, some of the trees began to develope leaf scorch, and the distribution of the scorching among the series appeared to be of such significance as to warrant the inclusion of the observations made in this report.

The details of the method of experiment, etc., followed are described fully in another paper,* so that it is only necessary at this point to refer broadly to the differential treatments given to the trees of the various series.

The trees of all the series were planted on February 25th, 1921. Previous to planting, all the root systems were treated in the Springfellow method and after planting all the trees were pruned.

The variety used was Cox Orange Pippin and all the trees were said to be on Broadleaved Paradise stocks. There were eight differential manurial treatments given, *i.e.*, there were eight series, and each series consisted of five trees. The details of the manurial treatments given to the various series were as follows :—

Series A.—Received a complete nutrient solution.
,, B.— ,, ,, ,, ,, ,, plus an extra amount of sodium sulphate.
,, C.—Nitrogen was omitted from the complete nutrient solution.
,, D.—Potash ,, ,, ,, ,, ,, ,, ,,
,, E.—Phosphoric acid ,, ,, ,, ,, ,, ,,
,, F.—Calcium ,, ,, ,, ,, ,, ,, ,,
,, G.—Magnesium ,, ,, ,, ,, ,, ,,
,, H.—Received rain water only.

Observations on the Foliage of the Trees.—Observations on the character of the foliage of the trees were made weekly during the growing season, but for the purpose of this paper it is sufficient to give an account of the observations made on two occasions, viz.,

---

* This Report, p. 154.

July 6th and September 24th, as on July 6th, the distribution of leaf scorch on the trees was typical of its distribution during the mid-season and on September 24th, of the leaf scorch present during the latter half of the season.

Further, it should be noted that the presence of leaf scorch on the trees was observed for the first time during the season on June 20th.

Observations made on July 6th.

Series A.

Trees Nos. 1 and 4.—There was no leaf scorch present.
,, No. 2.—A small amount of leaf scorch was present at the tips of leaves.
,, No. 3.—There was a medium amount of leaf scorch at the tips and on the margins of the leaves.
,, No. 5.—The leaves were all badly affected with leaf scorch.

Notes.—Nos. 2, 3, 4, were showing some yellowing of the leaves. No. 1 had started leaf growth very late and the leaves were small. The leaves of the trees in this series were generally well developed in size and were dark green in colour.

Series B.

Trees No. 1.—There was no scorch present. The leaves were small as in A1.
,, Nos. 2, 3, 4.—There was a fair amount of leaf scorch showing at the tips of the leaves.
,, No. 5.—The leaves showed bad leaf scorch at tips of the leaves and around the margins.

Notes.—The leaves of the trees in this series in general were very similar to those of the trees in Series A., both in colour, size and amount of leaf scorch present. Some of the leaves showed a little yellowing.

Series C.

There was no leaf scorch on any of the trees.

The leaves of the trees of this series were similar in size to those of Series A, but were lighter green in colour.

Series D.

Trees No. 1.—There was no leaf scorch present. The leaves were small as in A1.

Nos. —2, 3, 4, 5.—The leaves of all these trees were badly affected with leaf scorch.

Notes.—The leaves of the trees of this series previous to their becoming badly affected with leaf scorch were similar in size and colour to those of the trees in Series A, and had shown no signs of being in any way abnormal.

Series E.

Trees No. 1.—There was no leaf scorch present. The leaves were small as in A1.

„ Nos. 2, 4, 5.—There was no leaf scorch present.

„ No. 3.—The leaves showed a little leaf scorch at the tips.

Notes.—The leaves of this series appeared to be somewhat smaller than in Series A, and were slightly lighter green in colour. The leaves of Nos. 2, 3, 4, 5, showed signs of yellowing.

Series F.

Trees Nos. 2, 3, 4.—There was no leaf scorch present.

„ Nos. 1 and 5.—Showed a little leaf scorch at the tips and along the margins of the leaves.

Notes.—The leaves of the trees of this series were generally large and well developed. Nos. 1, 5, showed considerable yellowing of the leaves.

Series G.

Trees Nos. 1, 2, 3, 4, 5.—A small amount of leaf scorch, mostly at the tips of the leaves, was showing.

Notes.—The leaves of the trees appeared to be similar both in size and colour to those of the trees of Series A. The leaves of No. 1 tree were smaller than those of the other trees. Nos. 1, 2, 3, showed slight yellowing of the leaves.

Series H.

The leaves of the trees of this series were similar to those of Series C, being light green in colour and showing no leaf scorch whatsoever.

Summary of Observations on Leaf Scorch made on July 6th.

Series D.

The leaves of all the trees, with the exception of No. 1, showed severe leaf scorch. The trees of this series were affected with leaf scorch to a greater extent than those of any other series.

Series A, B, G.

The leaves in these series were affected to approximately the same extent. The amount of leaf scorch present was much less than in Series D.

Series E.

The amount of leaf scorch present in this series was slight. It was decidedly less than in Series A, B. G.

Series F.

Only one tree of this series showed signs of leaf scorch, and on this tree leaf scorch was only present at the tips of the leaves.

Series C, H.

There was no leaf scorch present in these series.

Observations made on September 24th.

Series A.

Trees Nos. 1, 2, 3, 4.—There was no leaf scorch present on these trees.

,, No. 5.—A small amount of leaf scorch was showing.

Notes.—The trees were still in full leaf. The leaves were of a normal green colour and showed no signs of falling.

Series B.

Trees No. 1.—There was no leaf scorch present.

,, Nos. 2, 3, 4, 5.—A small amount of leaf scorch was showing on these trees, mostly at the tips of the leaves.

Notes.—The leaves of the trees were similar in size and colour to those in Series A, and showed no signs of falling.

Series C.

Trees—There was no leaf scorch present on any of the trees.

Notes.—Nos. 2, 5, were completely defoliated.

,, Nos. 2, 4, were partly defoliated. The leaves remaining were pale green in colour.

,, No. 1 was in full leaf and the leaves were normally green.

Series D.

Trees No. 1.—The leaves showed slight leaf scorch—generally at the tips.

,, Nos. 2, 3, 4, 5.—The leaves of all these trees were badly affected with leaf scorch.

Notes.—The colour of the leaves where leaf scorch was not present was similar to those of Series A. Some of the leaves had fallen.

Series E.

Trees Nos. 1, 2, 4, 5.—There was no leaf scorch present.

,, No. 3.—The leaves showed slight leaf scorch mostly at tips. The leaves were smaller than in series A, and were still green. Some leaves had fallen.

Series F.

Trees Nos. 2, 4.—There was no leaf scorch present.

,, Nos. 1, 3, 5.—The leaves were showing a small amount of leaf scorch.

Notes.—The leaves on all the trees were large and well developed. Those on No. 2 were turning yellow.

Series G.

Trees Nos. 1, 2, 3.—The leaves were showing slight leaf scorch.

,, Nos. 4, 5.—The leaves of these trees were badly affected with leaf scorch, and were similar in appearance to those of the badly affected trees of Series D.

Notes.—The leaves of all the trees had commenced to fall. Nos. 4, 5, had lost considerable proportions of their foliage and the remaining leaves were in very poor condition. By October 10th, the leaves of all the trees of this series were very badly affected with leaf scorch.

Series H.

Trees.—There was no leaf scorch on any of the trees.

„ No. 1.—Was still in full leaf and the leaves were green in colour.

„ Nos. 2, 3, 4, 5.—These trees were partly defoliated and the leaves remaining showed considerable yellowing

Summary of Observations on Leaf Scorch made on September 24th.

Series D.

The trees of this series were affected with leaf scorch to a much greater extent than the trees of any other series.

Series G.

Two trees of this series were affected with leaf scorch to a similar degree to the worst trees in Series D. The amount of leaf scorch present in this series was second in amount to that in Series D.

Series A, B, F.

The amounts of leaf scorch present in these series were very similar and were only small. The amount in Series B., was slightly greater than in Series F, and the amount in F, slightly greater than in A.

Series E.

Only one tree of this series showed any leaf scorch and the amount present was very small. The total amount of leaf scorch present was less than in Series A.

Series C, H.

As on July 6th there was no leaf scorch present on the trees of these series.

Observations on the Root Systems of the Trees.

In order to ascertain whether the varying amounts of leaf scorch observed on the individual trees throughout the season showed any correlation with the development of their root systems, the trees were removed from the pots on December 10th, after all the leaves had fallen and the root systems examined.

The observations made are recorded below.

Series A.

Trees No. 1.—The root system of this tree appeared to differ in type from the remainder of the trees. It is probably of the free stock type, whilst the others are of the Paradise stock type. The root system of No. 1 was much smaller than the root systems of the others.

,, Nos. 2, 3, 5.—The root systems were well developed and showed fair amounts of recent growth.

,, No. 4.—The root system was similar to those of Nos. 2, 3, 5, but was not so well developed.

Series B.

Trees No. 1.—The root system was similar to A 1.

,, Nos. 2, 3, 4, 5.—The root systems were good and similar to A 2, 3, 4.

Series C.

Tree No. 1.—The root system was similar to A 1.

,, Nos. 2, 3, 4, 5.—The root systems were all well developed and were very similar in size to A 2, etc. They differed from these in the fact that the root fibre was finer and there was practically no recent growth to be seen.

Series D.

Trees No. 1.—The root system was similar to A 1.

,, Nos. 2, 3, 4, 5.—The root systems were all smaller in amount than the root systems of C 2, 3, 4, 5. The root fibre was similar in appearance to that of Series A, being coarser than in Series C, and the roots showed more recent growth than those of the trees of that series.

Series E.

Trees No. 1.—The root system was similar to A 1.

,, Nos. 2, 3, 4, 5.—The root systems were similar in amount to A 2, etc. The fibre was coarse and the roots appeared to be healthier in colour than in any other series. The amount of recent growth was greater than for Series A.

Series F.

The amounts of root formed by the trees of this series were less than in Series A, and the root fibre was finer than in this latter series. The amount of recent growth made was greater in this series than in any other.

Series G.

Trees No. 4.—The root system was similar to A 1.
,, No. 5.—The stock appeared to be weaker than those of the other trees, but was similar in type.
,, Nos. 1, 2, 3.—The roots of these were well developed, being similar in amount and in type of fibre to those of Series A. There was a fair amount of recent growth.

Notes.—The roots of this series were blacker in colour than those of the other series, which might be a sign of unhealthy root conditions.

Series H.

Trees No. 1.—The root system was similar to A.1.

Notes.—The root systems of this series were similar in amount and type of fibre to those of Series C. The amount of recent root growth was greater than in Series C, whilst the colour of the roots in Series C, was slightly darker than in Series H.

Summary of observations on the root systems made on December 10th.

Series D.

The amounts of root formed during the season by the trees of this series were less than in any other series. The root fibre was of a similar degree of coarseness to that of Series A.

The amount of recent growth made was greater than in Series C, H.

Series C, H.

The root systems in these two series were similar in amount and in type of fibre. The amounts in each series were almost equal to those of the trees in Series A, but the fibre was much finer. In Series C, there was practically no recent growth to be seen, whilst in H, there had been a certain amount of new growth made.

Series F.

The amounts of root made by the trees were less than in Series A. The type of fibre was similar to that of Series C, H. The amount of recent growth made was greater than in any other series.

Series G, E, A, B.

The amounts of root and the types of fibre made by the trees of these series were similar.

In Series E, the roots looked healthier than in any other series, and the amount of recent growth made was second to that made in Series F.

The roots in Series A and B were practically identical in all respects.

The roots in Series G were blacker than those of the other series and probably indicated unhealthy conditions.

Note.—Trees A 1, B 1, C 1, D 1, G 4, H 1, appeared to be on root stocks of the free stock type, whilst all the remaining trees were on stocks of the Paradise stock type.

PRODUCTION OF SCORCH BY STEM RINGING.

Those who have observed the effects of ringing of fruit trees will have noticed colour changes in the leaf and premature defoliation of the parts of the tree above the ring. In the case of bush apples ringed in spring, for example, the leaves concerned gradually became a yellowish shade of green and took on autumn tints at the end of the summer, while the foliage on parts of the trees unaffected by the ring behaved normally. Nothing in the way of a definite scorch follows ringing as a rule under Long Ashton conditions, and there is no ground for regarding the colour change referred to as being related to scorching. It appears to be simply a case of accelerated autumn effect.

On a few occasions, however, indications of undoubted scorch have developed within a relatively short time after ringing. One of the most striking cases, which can be quoted as an example, was that of a Jefferson fan-trained plum tree, growing against a wall of south-west aspect. It was ringed in the usual manner by the removal of a strip of bark as deep as the cambium layer. In this particular case the ring was not quite complete, but extended about seven-eighths of the way round the trunk. The leaves developed the regular yellowish tint in early midsummer and soon afterwards during a spell of hot dry summer weather suddenly scorched strongly. They became besides decidedly curled inwards. The trouble was confined to leaves exposed to full sun. Those more or less completely shaded remained green, uncurled and unscorched to the end and persistent on the tree rather later in the autumn.

The type of scorch in these cases is similar in general character to that occurring on scorching soils and its production is clearly a result of the ringing treatment, which, however, is only effective in certain instances and must, therefore, be then associated with other predisposing conditions.

EXPERIMENTS ON INTERFERENCE WITH WATER SUPPLY TO THE LEAF.

When during the course of last summer the cumulative evidence pointed more and more strongly to the water relations of the leaf as the ultimate factor to reckon with in connection with scorch, a number of attempts were made to induce scorch directly by interference with the vascular tissues supplying the leaf with water. The method adopted was the severance of the veins by the point of a sharp razor or scalpel, injury of the surrounding tissues being avoided as far as possible. In some cases the mid-rib only was severed, this being done at various points of its course along the leaf-blade in different leaves. In other instances lateral veins in various positions were cut and in yet other leaves the marginal veins were treated on similar lines. The result was unexpected. The treated leaves suffered no observable ill-effect whatsoever. Neither scorch nor wilt appeared and for weeks afterwards the leaves remained on the shoots apparently functioning normally. Ultimately wind brought the test to a conclusion by causing tearing of the leaf blades, beginning in the region of the cuts.

From this it would seem that the leaf tissues are remarkably well equipped for rapid conduction of water from one point to another and that the channel of supply to a given area is not necessarily along a definite route of vascular strands.

Failure to produce scorch by these means may possibly have been due to the time of year when they were tried. Scorch effects seem to be largely dependent upon atmospheric conditions favouring very rapid transpiration. The end of July and early August, when the trials were made, was a period marked at Long Ashton by a temporary break in the drought which prevailed over the summer as a whole. In addition it is questionable if normally at that season of the year in the West of England the amount of transpiration approaches that for June and early July, when scorch is most prevalent.

A more drastic method of restricting the water supply to the leaf was subsequently tested, a cut being made across the base of pulvinus through the vascular bundles supplying the leaf. Rapid change followed this treatment, the whole leaf surface becoming discoloured and leaf-fall taking place within the course of a few days. The discoloration was of a brownish character, but not quite typical of scorch. Until further experiments are made earlier in the summer it would be well to suspend judgment as to whether or not this represents an extreme case of scorch.

DISCUSSION OF RESULTS.

From the foregoing account of observations and experimental work it appears that the cases of leaf scorch recorded fall into a number of more or less distinct groups. With those directly caused by access of toxic substances to the leaf tissues from the surface of the leaf, under which head are included the salt spray injury referred to in Boodle's paper and the numerous instances of spray fluid injury familiar to all growers, the present article is not concerned, since they obviously stand apart from the form under investigation. The remainder cannot be so definitely dismissed from consideration and may be classed broadly as follows :—(*a*) those in which scorching is associated with soil conditions, (b) those in which scorching is a direct result of wind, (*c*) those caused by the action of heat on the leaf, and (*d*) those resulting from injury to the vascular system of the tree. In no case among those included under these classes is there any question of a foliage parasite being the immediate cause of the death of the cells of the leaf tissues in the scorched areas. Death without doubt results from unhealthy internal conditions within the cell, brought about in some manner other than direct attack by a parasite. To arrive at conclusions as to the manner in which these unhealthy conditions are produced it is necessary to discuss separately the evidence available for each of the groups indicated.

The first group, in which soil influence obviously comes into play, comprises cases which show clearly that this influence is of a varied character. The main feature which they have in common is a relatively poorly developed or defective root system of the affected plant. In this group scorching certainly is associated with inadequate root development. A soil, therefore, has scorching tendencies when it cannot sustain regularly the amount of root growth required by the plant. The cases investigated furnish illustrations of different methods of soil action in this respect. These may be referred to briefly in turn.

It was shown in the manurial experiments with apple trees in pots that, where potash salts were omitted from the food solution, the root development of the trees was poor and severe scorching was present. The analyses of the scorching soil samples A-J, also showed that the supplies of available potash in these soils were low. Further, the results with trees grown in soil to which a toxic substance, such as lithium carbonate, etc., had been added, show that scorching can be caused by the presence of such compounds in the soil when in quantity insufficient to produce immediate death. In all there instances the characteristic tip and marginal scorch on leaves of normal size has been observed. In other cases the plant makes very little growth and the leaves are much undersized. From the opening of the buds the foliage looks unhealthy and scorching is irregularly distributed over the leaf surface instead of being typically marginal. In some of these manurial treatment with potash salts has resulted in normal healthy growth and it is possible that all may be due to potash deficiency alone, notwithstanding that a lack of nitrogen may occur as well.

The mechanical character of the soil also seems in some cases to be capable of producing scorching. It is known that healthy root growth requires adequate soil aeration and the reference to the undersized and scorched leaf production shown by trees grown in water culture shows the association of that feature with defective root aeration. There is little doubt that in certain cases cited above the preponderance of the finer fractions indicates a badly aerated soil and correspondingly poor root development, the upper layers possibly being too dense sometimes and the tendency towards packing and the formation of a pan being marked in other instances.

The soils in other of the cases examined show poor water-lifting or holding capacity and it may certainly be assumed that during dry periods free root action and growth in them is restricted owing to inadequate water supply.

There is at least one further possibility in which the soil may be involved and that may be particularly noted, since it has been strongly favoured by the grower concerned in one of the cases described in detail above. It is that during the early part of the growing season root damage may occur as the result of an attack by an insect or fungoid pest present and active in the soil at that particular season. Provided that the damage were extensive enough it is possible and even probable that scorching would ensue, but there is practically no evidence in favour of this suggestion and there are at least two important results tending to negative it. To be effective the hypothetical pest would presumably be much in evidence at the critical season; yet no sign of any suspicious organism has been found in spite of careful search and the only suggestive circumstance discovered has been a series of superficial scars on the surfaces of certain roots sent in for examination. The cause could not be traced, but the extent of the trouble was certainly far too slight for it to be held responsible for the scorching observed on the foliage of the affected trees. On the other side, the facts (a) that scorching soils retain their scorching qualities after sterilisation by heat, as shown by the bean experiments, and (b) that severance of a considerable proportion of the main root system did not induce scorching in pot apple trees thus treated, seem decisive and, while not necessarily disproving the root damage by pest hypothesis, show that very positive evidence should be furnished before it could be justifiably accepted.

The second group of cases, those in which scorching is directly a wind effect, seems to be composed of two distinct sets. The one is dealt with in some detail in Boodle's paper and is, according to that author, to be regarded as caused by excessive transpiration, resulting from the play of drying winds upon the foliage. The other, according to the observations of Barker and Gimingham, shows wind action in a somewhat less direct manner, the leaf tissues being affected locally by the chafing of one leaf upon another when stirred by breezes. Whether unhealthy cell conditions are set up through such mechanical irritation, or whether the cuticular surface is weakened and excessive transpiration follows on that account, has not been positively settled.

The third class of case, in which heat appears to play the primary part, is particularly well illustrated by the example quoted where scorch appeared on orchard trees exposed to hot air coming from a neighbouring fire. Instances of scorching of foliage under glass and of spot scorching after watering in hot sun are probably rightly regarded as " burns " pure and simple.

In the fourth group of cases interference with the vascular system of the tree is regarded as the cause of trouble. The example given of scorching following bark-ringing in the case of a plum tree furnishes an illustration of this type and the marginal scorch frequently seen on the foliage of trees attacked by a vascular parasite, *e.g.*, on gooseberries in the early stages of an attack of the " die-back " fungus, *Sclerotinia fuckeliana*, also falls under the same head.

This brief summary will suffice to show the varied character of the conditions which induce scorching. The question naturally arises as to whether the death of the affected parts of the leaves is due in all these instances to the same immediate cause, or whether the latter is variable as well as the predisposing conditions. Boodle's review of previous workers' opinions indicates a general inclination to regard scorch as a case of death due to unhealthy cell conditions produced by dessication resulting from excessive transpiration. The tendency of the leaves in most cases to show the first signs of scorch at the tips and margins or, in other words, in those regions most remote from the main vascular supply, has been regarded as strongly favouring that view. This aspect, therefore, calls for first consideration.

At the outset it should be explained that the term "excessive transpiration" will be used here in a relative and not absolute sense. Whether the amount of transpiration is excessive or not in this connection obviously depends as much upon the quantity of water reaching the cell as upon that given off by it.

That loss of water by transpiration is intimately connected with scorching seems likely, since generally in all the types of cases recorded the trouble appears most markedly in hot sunny and dry spells of weather; but this point must not be pressed too far, since other forms of activity on the part of the plant may also be intensified under those conditions. Moreover, the facts that scorching occurs in wet seasons and also on the foliage of trees grown in water culture suffice to demonstrate that the matter is not a simple one of amount of transpiration alone.

The forms of scorching brought about by soil influence up to a point are in accord with the excessive transpiration hypothesis. Thus the relatively poor root formation characteristic of such cases is presumably associated with a relatively low intake of water and the periods during the growing season when atmospheric conditions favour rapid transpiration are also those when the soil has least water available for the tree. One can imagine, therefore, a tendency towards a lack of water in the most affected parts of the foliage. On the other hand, whatever might be the case with a newly planted tree, it would be expected that an established tree would so balance shoot and root production that the leaf surface produced would not be greater than the existing root system was capable of maintaining. Although on typical scorching soils scorch is often observed to grow more severe as the tree ages, yet in the extreme cases after several years the leaves produced are so small that they do not scorch. Here apparently the balance between root and leaves is restored. Then again the production of a second crop of leaves which escape scorch, a common occurrence on many scorching soils, is at first sight not easy to account for if the root system remains inadequate. These difficulties are emphasized by the results of some of the earlier experiments with trees in pots. In those, as already described, when from the beginning of the growing season supplies of water at the root were kept low and the trees themselves were placed under glass in a relatively dry atmosphere so as to secure optimum conditions for a high initial rate of transpiration, the foliage from the start was relatively poorly developed, quite in keeping with the deficient water supply at the root, and no typical scorch was produced. In other words, the tree adjusted its leaf surface to its root system and available water supply. By keeping the latter very low wilting of the leaves in hot weather ensued, but never any typical well-developed scorch.

Some light may be thrown upon this aspect of the question if the results described in a later article in this Report, that dealing with Studies on Root Development, are considered. The suggestions here made are to be regarded as purely tentative, since they have arisen as the outcome of two series of investigations conducted during the past season which at the outset were not thought to be in any way related and no opportunity for testing them can occur before the growing season of 1922. In the article referred to, it is shown that apparently root growth varies considerably in rate at different periods of the growing season. For a short time at the beginning of the season it is active; then, while shoot growth is continuing relatively rapidly, it becomes markedly slowed down; and finally, as shoot growth slackens, it revives and remains active for the remainder of the growing season. From the point of view of leaf scorch it is significant that, except for the earliest period of growth at the start of the season, shoot and root growth do not correspond in pace. The observed facts seem to indicate that, while this initial growth on the part of both shoot and root is dependent primarily on reserves stored in the tree from the previous season's activities, after their exhaustion root growth is dependent on elaborated food passed down from the aerial portion of the tree. So long as the growth of the shoots is favoured by general conditions, they, being nearest the centres of production of food, viz., the leaves, are able to draw first on the available supply and in consequence restrict for the time being new root development on that account. For a time, therefore, comparatively early in the growing season, shoot growth tends to outstrip root growth. In due course a balance is reached, because the inferior root development must by degrees react on the shoots, tending to retard the further growth of the latter owing to the proportionately smaller amounts of water and salts which can be taken up from the soil. While this balance is being stuck, however, there must be a tendency for a shortage of water supply to the shoots, especially if atmospheric conditions happen during that time to favour a high transpiration rate, and drought lowers the content of water in the soil. The leaves as a part of the shoot system may, therefore, be temporarily short of water, a condition already indicated as leading to scorching. The cases of early summer scorching typical of certain soils may thus be accounted for. It remains to be considered how the affected trees can produce subsequently a second crop of leaves free from the trouble. Since scorching automatically reduces the amount of transpiring leaf surface, the adjustment of balance between leaf and shoot should be aided by scorch. Once this balance is arrived at, there seems no reason why normal shoot and leaf production should not be renewed. As the full new crop of foliage is developed in such cases during the second half of the growing season, by the time the total leaf surface is formed the atmospheric conditions normally no longer favour a high transpiration rate, and the risk of scorching has passed or at least is minimised. Rate of shoot growth also at that season has naturally slackened greatly and accordingly the tree is able to build up for the ensuing year a reserve of food to start the new season's growth from the activities of the second leaf crop. On that account the earliest shoot and leaf growth of the season need not present any markedly abnormal features or obvious signs of ill-effect from the scorch attack of the previous year, this notwithstanding that, compared with an unaffected tree, the total growth for the whole season may be materially lessened consequent on the inevitable check to shoot growth which must occur if scorching is severe and followed by complete or partial defoliation. In course of time the tree subject to scorch will naturally be materially weakened and signs of the drain on its constitution will become increasingly obvious.

The cases of scorch due to wind action accord with the water deficiency hypothesis, including those cited by Barker and Gimingham. The rate of loss of weight of leaves which had been exposed to chafing caused by wind having been proved to be materially greater than that for untouched leaves is a fact which certainly suggests that too rapid loss of water is associated with the scorching which ultimately developes in the former instance. Wind scorch, it will be noted, does not necessarily involve an inadequate water supply from the roots. The latter may be in perfect working condition ; the leaf alone may be in fault, through being unable to accommodate itself properly to the high rate of transpiration induced by the atmospheric conditions.

Something of the same kind may hold for the cases of heat scorch. Failure of accommodation by the leaf to sudden calls resulting from temporary high temperatures, is an explanation which fits the observed facts better than one which suggests a general deficiency in water supply within the plant, although even here also the rate of transpiration factor almost certainly comes in. Whether heat scorch is really a " burn " and, if so, whether there is any essential difference between " burn " and " scorch," are questions which will be considered presently.

The last group of cases, those connected with interference with the vascular tissues of the plant, naturally are, under a hypothesis involving interference with the water supply to the leaf, readily accounted for in all instances where the interference extends to the xylem portion of the vascular tissues. Where only the phloem is obstructed or severed, as in the case of scorch following ringing, the explanation does not appear so obvious. It is true that there is some loss of water from the exposed vascular system at the ring, but that does not seem sufficient to cause scorch in itself, otherwise ringing should normally be followed by scorching: and this is not the case. Although the water factor probably comes in here also, the matter seems more complex than one of mere interference with water supply to the leaf.

We reach, therefore, the conclusion that excessive transpiration or, possibly more accurately, the water relations of the leaf tissues are apparently involved in all the cases of scorch referred to, but at the same time the trouble is not caused solely by a deficiency in the quantity of water supplied to the leaf. Lack of water alone results in wilting and the leaf may recover without any trace of scorch when the water supply is readjusted to requirements. Exposure to heat, *e.g.*, bright sunshine in the height of summer, or to strongly drying winds inducing very rapid transpiration, appears to be required to intensify the effects of a defective water supply before vital changes within the affected cells proceed so far that death results and a typical scorch is produced. As to the immediate cause of death the present position of knowledge does not justify any positive answer and possibly it may vary in individual cases. It has been suggested by different authorities that (*a*) it may be due simply to conditions of extreme dessication unduly prolonged, and (*b*) it may result from a toxic concentration of salts, or other substances within the cell caused by too great a loss of water. In either case the osmotic properties of the cells themselves and of the adjacent tissues become points of importance, and about them there is at present little precise knowledge available.

There is a third possibility, which we suggest as worthy of examination and which so far as we are aware has not hitherto been considered. It is that death is caused by the inability of the cell to regulate its temperature within vital limits. There must be occasions when leaves of growing plants, especially in the Tropics or under glass, are exposed to sun heat sufficient in itself to be toxic, unless the cells possess means of regulating their own temperature. Since a healthy plant survives such exposure uninjured, it follows that cell temperature can be adjusted by it as required. The obvious methods of adjustment which suggest themselves are those of increased chemical activity and of increased transpiration, either of which would result in a lowering of temperature brought about by the heat absorbed in the operations. Shortage of water supply to the cell has already been pointed out as a feature of scorching ; hence it appears a plausible suggestion that cell death results from an inability to transpire sufficiently rapidly to keep the temperature within vital limits.

While the foregoing discussion demonstrates that at present an attempt to explain why leaves scorch involves much that is still speculative, this investigation has on the practical side a more definite and satisfactory result to show. The primary intention was to find, if possible, a method of prevention of leaf scorch on soils subject to the trouble, and it may be claimed that, although complete success may not be practicable in all cases, much has been learnt which encourages the hope of a considerable degree of control in many instances.

There are three factors which stand out most clearly, viz., potash effect, the influence of grass and rootstock action. The correlation which has been noted between the amount of potash supply, root growth and the degree of leaf scorch, points very definitely towards the liberal application of potash manures as a remedial measure, unless it is known that the soil in question has already an abundant supply of available potash.

As regards grass influence the facts that scorch is rarely recorded for trees growing in grass and that in the case of one of the first scorching soils examined, the trees on which showed the trouble to a pronounced degree, the owner eventually decided to grass the plantation down, since when scorch is reported to be mitigated, suggest very strongly that growth of a cover-crop of grass is likely to be very effective in reducing scorch or causing its complete disappearance. The manner in which grass may act is a question which involves a lengthy discussion and no conclusive decision could be arrived at, since evidence not yet available is required.

This it is hoped to secure from further investigation and further consideration of the point is best left over until such additional information is acquired.

After what has been shown as to the general association of a relatively poor root system with leaf scorch and the importance of active root growth, it follows that for soils with a tendency towards scorch only trees worked on free-growing types of rootstock should be planted. In addition, cultural operations tending to encourage active root growth and manurial treatment with the same object are obviously likely to lead to greater resistance to scorch.

In view of the apparent importance of restricting as far as possible the loss of water by trees on scorching soils, nitrogenous manuring should be conducted with discretion. While trees dwarfed by continued scorch effect may need nitrogen as well as potash to bring about renewed healthy growth, heavy nitrogenous dressings must tend to the production of a dangerously large leaf surface. It may well prove that it is better to withhold nitrogen altogether until improvement by potash treatment alone has been secured.

The data already obtained relating to the chemical and physical composition of scorching soils suggest that, when more information in this direction has been accumulated, it may be possible to predict with a fair degree of certainty the liability of any given soil to scorch. The importance of this point in preventing the grower from planting on unsuitable soils is obvious.

Wind scorch obviously is most easily avoided by refraining from planting in wind-swept situations. It this is at times unavoidable, the establishment of windbreaks should lessen the trouble.

The other forms of scorch are more special cases and in general largely beyond the grower's control, where fruit culture is concerned.

THE ASSOCIATION OF BLACK CURRANT MITE (Eriophyes ribis) WITH REVERSION DISEASE.

(A. H. Lees.)

For some years certain growers of black currants familiar with both diseases have been of the opinion that there is a close association beween the two. Not every grower holds this opinion, but the fact that some do, and that field experience supports the idea, made it advisable to collect statistical information at the Research Station. In order to do so a small plantation of about 250 bushes was selected for trial. The plantation was not ideal for this purpose, as the bushes were cuttings from seedlings and so might be excepted to vary greatly in resistance and general behaviour. No other plantation was, however, available. For two years each bush has been marked twice, once in winter for amount of Big Bud and once in summer, about June, for amount of Reversion. The amounts of Big Bud infection were arranged in six classes 0—5, and the reversion into three—normal, partly reverted, and reverted. The symbols used for these classes are N, F R (fractionally reverted) and R. A partly reverted bush was one which showed part of the bush only reverted, or the whole bush partly reverted, according to the leaf vein method.

By this means the behaviour of every bush over the two years was noted. For instance a bush having marking N 1 R O, would mean that in the first summer it was normal, in the second revert, in the first winter it had a very few big buds in the second, none. Similarly F R I R 3 would mean partly revert in the first summer and revert in the second, Class 1 Big Bud in the first winter and Class 3 in the second.

Table 1 shows the association of the various classes of Big Bud, with the amounts of Reversion for both years. The figures are expressed as percentage of the total class figures (0—4, class 5 being absent), that occur in the three classes of Reversion. Thus in Class 0, first year, 66% were normal, 18% fractionally revert and 15% fully revert.

TABLE I.

1ST YEAR—PERCENTAGES.

	CLASS 0.	CLASS 1.	CLASS 2.	CLASS 3.	CLASS 4.
N ..	66	21	4	0	0
F R ..	18	8	5	0	0
R ..	15	71	90	100	100

2ND YEAR—PERCENTAGES.

	CLASS 0.	CLASS 1.	CLASS 2.	CLASS 3.	CLASS 4.
N ..	81	30	0	0	0
F R ..	10	28	16	10	0
R ..	9	42	84	90	100

The points that this table bring out are as follows :—

(1) In each year a high percentage of Class 0 are normal.
(2) In each year a high percentage of Classes 2—4 are revert.
(3) The fractionally revert occur mostly in Classes 0—2 in both years.
(4) In the first year none of Class 3 or 4, and in the second year none of Class 2, 3 or 4 were normal.

It is approximately true to say that as soon as a bush reaches Class 2 of Big Bud infecton it ceases to be normal.

Table 2 gives the number of bushes occurring in all the possible combinations. All classes of Big Bud infection are denoted by the symbol 1, its absence by 0.

TABLE II.

NONO	62	NINO	9	RONO	2	RINO	1
NONI	14	NINI	6	FRONO	14	FRINO	4
NORO	3	NIRO	0	RONI	0	RINI	1
NOFRO	5	NIFRO	0	FRONI	3	FRINI	2
NORI	1	NIRI	0	RORO	3	RIRO	2
NOFRI	3	NIFRI	4	FRORO	1	FRIRO	0
				ROFRO	2	RIFRO	0
				FROFRO	4	FRIFRO	0
				RORI	8	RIRI	72
				FRORI	0	FRIRI	2
				ROFRI	7	RIFRI	14
				FROFRI	1	FRIFRI	1

As might be expected the largest number of bushes are found in the two groups N O N O and R I R I, showing the association of normality with freedom and Reversion with presence of Big Bud.

Table 3 shows a condensation of this table and the association of 0 (absence of Big Bud,) and of I (presence of Big Bud), with the three classes of Reversion.

TABLE III.

Occurring in class	Percentage of 0.		Percentage of 1.	
	1st year.	2nd year.	1st year.	2nd year.
N ..	69	84	17	20
F R ..	18	9	7	22
R ..	13	7	76	58

In both years the largest percentages are N with O, and R with I, but it is also clear that other combinations occur in numbers in excess of experimental error. The average percentage of F R O is 13·5 and of R O, 10, which indicates that an appreciable percentage of bushes free from Big Bud are partially revert, or revert. That this is so, is of course, not surprising in that it is known that mite-free cuttings from reverted bushes remain reverted.

The average percentage for N I is 18·5. This indicates that bushes may be attacked by Big Bud and yet remain normal. This fact was brought out in Table 1, but it was there shown that bushes remain normal only when Big Bud infection was slight.

In Table 4 the facts are regarded from a different point of view. Here, in the upper half, the percentages of first year normals, fractionally reverts and reverts that become normal, fractionally revert and revert in the second year, are noted. In the lower half the numbers are further analysed. The upper half brings out the facts that normals tend to remain normal and reverts, revert. It also shows that fractionally reverts tend to become normal in the second year and that only a small percentage become completely revert. It is clear that the condition of fractional Reversion is a temporary one in most cases. It may represent several possible different states; a bush may be recovering from true Reversion, or part only of the bush may be attacked by Reversion, or the whole bush may be showing a partly reverted type of leaf due to temporary conditions of growth stimulus.

In the lower portion of the table a comparison is made between the second year behaviour of bushes that are, or are not, attacked by Big Bud.

TABLE IV.

PERCENTAGE IN FIRST YEAR OF	BECOMING IN SECOND YEAR N.	F R.	R.
N	85	11	4
F R	72	19	9
R	4	20	76
N O	86	9	5
N I	79	21	0
F R O	74	22	4
F R I	67	11	22
R O		41	50
R I		16	82

Here the association of I with N (that is the difference in the subsequent history of normal bushes not attacked and attacked with Big Bud) causes a depletion in the second year N's and R's, and an increase in the second year F R's.

The association of I with F R, causes a depletion for the second year N's and F R's and an increase in the second year R's.

The association of I with R, causes a depletion in the second year N's and F R's, and an increase in the second year R's.

These changes can be diagraminatically represented thus:

N I causes { N—>F R.
R—>F R.

F R I " { N—>F R—>R.
F R—>R.

R I " { N—>F R—>R.
F R—>R.

Broadly speaking, therefore, an attack of Big Bud always causes a bush to move in the direction of Reversion. The only exception in the above table is in the first year normals which, not attacked by Big Bud gave 5% reverts, and attacked 0%. The percentage only represented four bushes and is not beyond the limits of experimental error.

CONCLUSIONS.

This statistical examination brings out the following facts for the bushes under observation.

(1) That normal bushes are generally free from Big Bud infection, but may be slightly attacked.
(2) That reverted bushes are usually attacked by Big Bud, but that an appreciable percentage are free.
(3) That bushes moderately strongly attacked by Big Bud are always reverted.
(4) That it is thus possible to have very reverted bushes that are not attacked by Big Bud, but not possible to have bushes heavily attacked by Big Bud that are not reverted.
(5) That Big Bud attack in the first year causes a bush to become more reverted in the second year than if it had remained free from Big Bud.

SPRAYING TRIAL FOR CONTROL OF LOGAN BEETLE.

(A. H. Lees and G. S. Peren.)

In view of the results obtained last year, which appeared to indicate the desirability of giving three arsenate sprayings to cover more fully the somewhat prolonged blossoming season of the loganberry, the following trial was carried out.

Twelve rows of logans were used. Three-quarters of each row were sprayed and the remaining quarter left as control.

The first spraying was applied when approximately one third of the blossom was out, the second, when two thirds were out, and the third when the bushes were in full bloom.

The following formula was used :—

Arsenate of Lead	4lbs.
Water	100 gallons.

Pressure of application 215lbs. per square inch.

First application	May 18th.
Second ,,	May 24th.
Third	June 2nd.

The results obtained are set out in Table 1.

From these figures it will be seen that the sprayed berries averaged 4·4% infected, while the unsprayed averaged 19·8% infected.

In estimating the value of the treatment the last four pickings may reasonably be left out of account, since the first eight cover the important bulk of the crop and the last four merely represent the scattered fruit from very late flowers. The pickings on July 18 and 20th were hardly worth the expense involved.

If then the figures of the first eight pickings are taken, it will be seen that the total average of infected berries is 3·5%, for the sprayed, as against 20·7% for the unsprayed, which represents a very considerable improvement in market value.

Referring to the column showing the percentages infected per picking, it will be seen that in the case of the sprayed berries, there is a steady increase from ·3% to 11·6%, with the exception of the pickings on July 1st and July 18th, and the slight drop on July 7th. On the other hand the unsprayed berries show heaviest infection, *i.e.*, 27·5% at the third picking, on June 29th, and again an almost equally heavy figure of 27·3% on July 4th, after which the figures tend to decrease. The six pickings from June 29th to July 11th inclusive, show the worst effects and it may, therefore, be taken that this period represents a period of similar length of time when the major part of ovipositing took place.

There is practically no correlation between the two columns of percentages infected, except for the small mutual drop on July 1st, which may have been due to weather conditions at the corresponding egg-laying date. This general lack of correlation and steady increase of the figures for the sprayed berries may possible be explained by the fact, that the first third of the blossoms received three sprayings, the second third two sprayings, and the final third one spraying. One might thus suggest that the first two pickings show the full effect of three sprayings, the third, fourth and fifth pickings, the result of two sprayings, and the sixth, seventh, eighth and ninth the result of only one spraying. In the absence, however, of laboratory control these ideas must be regarded as tentative. As the period of time covered by the application of the sprayings was only 15 days, and as it was observed that a certain number of very backward trusses flowered after the last spraying was given, it may be safely assumed that a certain portion of the berries in the last three pickings received no spraying at all. In view of these facts one would expect to find the steady increase shown as opposed to the rise and fall in the figures for the unsprayed berries.

The results obtained are considered quite satisfactory, especially

TABLE I.

Date of Picking.	Sprayed.			Unsprayed.		
		Infected.			Infected.	
	Sound.	Number.	Percentage	Sound.	Number.	Percentage.
June 23rd.	285	1	·3	302	24	7·4
„ 27th.	378	3	·8	367	58	13·6
„ 29th.	236	9	3·7	195	74	27·5
July 1st.	328	9	2·7	189	51	21·2
„ 4th.	246	11	4·2	282	106	27·3
„ 5th.	271	17	5·9	236	80	25·3
„ 7th.	269	15	5·3	236	73	23·6
„ 11th.	274	19	6·5	275	79	22·3
Totals	2287	84	3·5	2082	545	20·7
July 14th.	313	22	6·6	279	52	15·7
„ 16th.	113	14	11·0	115	24	17·3
„ 18th.	131	14	9·6	109	20	15·5
„ 20th.	144	19	11·6	138	31	18·3
Grand Totals	2988	153	4·9	2723	672	19·8
Numbers examined ..	3141			3395		

those for the first eight pickings, and in the case of the grand totals 4·9%, as opposed to 19·8%, or 153 berries infected in 3141, as opposed to 672 in 3395, represents a difference which in the crop off even an acre would be of very considerable bulk.

It is hoped that if the same measure of control can be obtained for some three years in succession, it will then be possible to dispense with the spraying for at least one or two years, thus partially compensating for the expense involved in three applications.

THE EFFECTS OF MURIATE OF POTASH AND SULPHATE OF POTASH ON THE COOKING AND KEEPING QUALITIES OF POTATOES.

(*T. Wallace.*)

The experiment described below was carried out as the result of the large number of post-war enquiries received regarding the probable bad effects produced on the quality of potatoes by growing them with muriate of potash. This question has assumed great importance since the war, owing to the fact that whereas we in this country are dependent on Germany for the large proportion of our supplies of sulphate of potash, we can obtain supplies of muriate of potash from the mines of Alsace-Lorraine, and from the flue-dust of the blast furnaces of this country.

The opinion that muriate of potash does affect the quality of potatoes adversely is very widely held by farmers, but this opinion does not appear to have the support of any recorded experiments.

PLAN OF EXPERIMENT.

The experiment was carried out on one early variety—Sharpe's Express—and on one maincrop variety—Scottish Farmer.

In the case of each variety there were three plots under differential manurial treatments, viz :

Sharpe's Express Plots.

Plot A.—Control Plot.—Dressed with town stable manure and nitrogenous and phosphatic manures.

Plot B.—Muriate of Potash Plot.—Dressed with manures as in Plot A, and muriate of potash.

Plot C.—Sulphate of Potash Plot.—Dressed with manures as in Plot A, and sulphate of potash.

Scottish Farmer Plots.

Plot A.—Control Plot. Dressed with nitrogenous and phosphatic manures only.

Plot B.—Muriate of Potash Plot.—Dressed with manures as in Plot A, and muriate of potash.

Plot C.—Sulphate of Potash Plot.—Dressed with manures as in Plot A, and sulphate of potash.

The details of the manuring of the plots are given in the detailed accounts of the plots of the two varieties.

The crops obtained from the plots were treated for experimental purposes as follows :—

(*a*) The yields from each plot of ware potatoes, seed potatoes and " chats " were determined.

(*b*) Even samples of medium sized potatoes—each sample weighing 1 cwt.—were selected from the crop of each plot to carry out the following tests and laboratory determinations.

(1) Determination of percentage of dry matter in the tubers.
(2) Determination of percentage of total nitrogen in the tubers.
(3) Determination of loss in weight of tubers on keeping for a considerable period.
(4) Determination of keeping qualities of the tubers.
(5) Cooking tests at various intervals after date of lifting.

Methods adopted in carrying out Tests.

(1) Determinations of percentages of dry matter and of total nitrogen were carried out in the usual manner immediately after the crops were lifted.

(2) To determine the loss of weight on keeping, one hundred potatoes from each plot were placed side by side on a perforated zinc tray. The trays containing the samples from the various plots were kept on shelves in a cool dry room lighted by a window facing due north, the potatoes being exposed to this light. The samples of potatoes were weighed in bulk at intervals and the loss in weight determined.

(3) In order to test the keeping qualities, the potatoes left over from each of the 1 cwt. samples, after samples had been drawn for the various tests described above, were kept in sacks in a cool dry room and observations made at intervals on their keeping qualities.

(4) In the cooking tests some samples of the potatoes were boiled without removing the skins and some baked without removing the skins. The freshly cooked potatoes were tasted by numerous observers, who attempted to place the samples in order of " mealiness," and observations were made on the relative tendencies of the cooked samples to blacken.

Weather.

The weather during the growing season was abnormally dry and hot during the spring and summer, and abnormally mild and with the rainfall below the average during the autumn. During the period over which the early variety occupied the ground scarcely any rain fell and the soil of the plots was generally very dry.

The soil of the Scottish Farmer plots remained very dry until the middle of August, when there were some heavy showers of rain, after which the plants began to make vigorous growth. From this time it was observed that many of the tubers began to make secondary growths, and on examining the tubers after lifting it was noted that the tubers from all the plots varied greatly among themselves. Some of them—presumably of primary origin—had thick tough skins, whilst the later formed ones had thin skins, which could be easily broken by rubbing with the fingers.

In carrying out the tests on this variety, potatoes were used which were judged to be of the same degree of maturity and samples of the mature and immature potatoes from the various plots were put aside as separate samples for tests on keeping quality.

Soils of the Experimental Plots.

Samples of the surface soil were taken for analyses from the areas used in the two experiments, prior to the application of the manures. The results of the analyses are appended in Table III.

EXPERIMENT WITH SHARPE'S EXPRESS.

Plots.—The area of each plot was approximately 1/20th of an acre.

Planting.—The potatoes on all the plots were planted during the period April 8th-April 11th.

Manurial Treatment.—The following manurial dressings were applied to all the plots.

5 tons of Town Stable manure per acre, applied winter 1920-21.
2 tons of Shoddy (6-7% Nitrogen) per acre, applied winter 1920-21.

1 cwt. Sulphate of Ammonia per acre, applied April 7th, 1921.
4 cwt. Superphosphate, per acre, applied April 7th, 1921.

In addition, the potash plots received dressings of muriate and sulphate of potash respectively to supply 58 lbs. of potash (K_20) per acre on April 7th, 1921.

Lifting.—The crops were lifted on August 24th and 25th, by which time the haulms had completely died down.

Disease.—Almost the whole of the tubers lifted from the plots were affected to some extent with common scab, and appeared to be free from other diseases.

Plot Yields and Results of Laboratory Tests.

The results of plot yields, dry matter and nitrogen determinations are appended in Table 1.

Cooking Tests.

Cooking tests were carried out on September 20th and December 15th. On both occasions ten observers took part in the tests and the results obtained showed no agreement as to any one sample of potatoes, differing greatly from the others. Indeed, many of the observers were of opinion that the differences among the potatoes of any sample were as marked as any difference between the samples from the three plots.

As regards the blackening observed among the potatoes on standing, on both occasions there was very little blackening observed in any of the samples used in these tests, even after the samples had stood at room temperature overnight, and there were no differences to be observed between the samples themselves.

Keeping Qualities.

Periodical examinations were made up to January 21st, 1922, up to which date no essential differences were observed between the different samples. By the end of November, 1921, the potatoes in the sacks had sprouted considerably and felt soft, and by January 21st, 1922, they were obviously unfit for ware purposes.

Loss in Weight of Tubers on Keeping.

The results obtained during the period August 26th to October 29th, on the rates of loss in weight of the tubers selected for this purpose are tabulated in Table II. After this latter date, the potatoes began to sprout considerably and as this would necessarily complicate the rate of loss in weight of the tubers the results obtained to this date only are given.

Examination of the results shows that the tubers from the two plots receiving potash salts lost in weight at approximately the same rates throughout the period, whilst the rate of loss in weight of the tubers from the control plot was considerably faster than the rates of loss in weight of those from the potash plots.

EXPERIMENT WITH SCOTTISH FARMER.

Plots.—The area of each plot was approximately 1/18th acre.

Planting.—Planting was carried out during April 18th and 19th.

Manurial Treatments.—All plots were given the following dressings of manures.

2 tons of Lump Lime per acre, applied winter 1920-21.
2 tons of Shoddy (6—7% Nitrogen) per acre, applied winter 1920-21.
1 cwt. Sulphate of Ammonia per acre, applied April 17th, 1921.
4 cwts. Superphosphate per acre, applied April 17th, 1921.

The potash plots were dressed with the respective potash salts to supply 58 lbs. of potash (K_2O), per acre.

Lifting.—The crops were lifted on October 14th and 15th.

Disease.—The tubers appeared to be entirely free from disease at the time of lifting.

Plot Yields and Results of Laboratory Tests.

These are appended in Table I.

Cooking Tests.

Cooking tests were carried out on November 16th, 1921, and January 18th, 1922. As in the tests with Sharpe's Express, the results obtained failed to show any distinct differences between the quality of the different samples as regards palatability.

As regards the tendencies of the potatoes of the different samples to blacken, it was observed on both occasions that the potatoes from the control plot showed considerable blackening both in the boiling and baking tests after standing for about 10-15 minutes, whilst those from the potash plots showed scarcely any blackening even after standing over-night at room temperatures.

Keeping Qualities.

Up to January 21st, 1922, the mature potatoes from all three plots had remained very firm and had sprouted only very slightly. Some of the immature potatoes were quite soft and were probably unfit for ware purposes.

Loss in Weight of Tubers on Keeping.

Observations were carried out over the period October 20th, 1921—January 20th, 1921. Only tubers which appeared to be ripe were used, as it was thought that consistent results would not be obtained if unripe tubers were used.

The results obtained in this experiment are similar in character to those obtained in the experiment with Sharpe's Express, *i.e.*, the tubers from the two potash plots lost in weight at practically equal rates, whilst those from the control plot lost in weight at a considerably greater rate than those from these two plots. This was especially the case up to November 11th, 1921.

DISCUSSION OF RESULTS.

In considering the results obtained in these experiments, it is well to bear in mind the facts that the weather conditions during the season of 1921 were very abnormal, and that the season was unsuitable for the carrying out of an experiment on potatoes. Some of the results obtained may, therefore, be peculiar to the conditions which existed during the season and it is desirable that the experiment should be repeated in a more normal season.

Yields.

In the experiment with Sharpe's Express no increase in the yield of tubers was obtained by the use of either muriate or sulphate of potash. In this connection it should be noted that all three experimental plots received light dressings of town stable manure. In the Scottish Farmer plots, where no dung was applied, an increase in yield of 26% over that of the control plot was obtained by the use of the muriate of potash. The increase obtained on the sulphate of potash plot, viz., 8·4%, is probably well within the limits of experimental error.

Laboratory Tests.

In both experiments it was found that the tubers from the plot giving the lowest yields contained the highest percentages of dry matter, whilst those from the plots giving the highest yields contained the lowest percentages of dry matter.

This relation also held between the yields of tubers and the percentages of total nitrogen contained in the tubers in the experiment with Sharpe's Express. In the experiment with Scottish Farmer, the percentages of total nitrogen found in duplicate determinations showed considerable differences.

Cooking Tests.

In view of the great diversity of opinion shown in these tests, it may be safely said that muriate of potash does not appear to have adversely affected the quality of the potatoes grown in these experiments.

Further, in the experiment with Scottish Farmer, both the muriate and sulphate appeared to have affected the composition of the potatoes in some way, as was shown by the fact that potatoes from these plots after boiling or baking did not blacken so readily on standing as those from the plot receiving no potash salts.

This difference was not observed with the Sharpe's Express potatoes, in which experiment town stable manure had been applied to all three plots.

Keeping Qualities.

In neither experiment did either of the potash salts appear to have affected the keeping qualities of the tubers in any way.

Loss in Weight of Tubers on Keeping.

In both of the experiments the tubers from the muriate and sulphate plots lost in weight at approximately equal rates, which rates were slower than those at which the tubers from the respective control plots lost in weight. It would appear from these results that potash plays some part in regulating the rate at which moisture is given up from the cells of potato tubers.

TABLE I.

VARIETY—SHARPE'S EXPRESS.

Plot.	Details of crops.	Nos. of tubers per plot.	Yields of tubers per plot. (lbs.)	Yields of tubers per acre. (tons.)	Dry matter in tubers. %	Yields of dry matter per acre (tons.)	Total Nitrogen in tubers. %
Control	Ware	4085	690·5				
	Seed	1802	143·5				
	Chats	2516	78				
	Totals	8403	910	8·12	25·11	2·04	0·382 0·380 } 381
Muriate of Potash.	Ware	3803	630				
	Seed	1645	127				
	Chats	2798	78·5				
	Totals	8246	835·5	7·45	25·73	1·91	0·403 0·415 } 0·409
Sulphate of Potash.	Ware	3937	603				
	Seed	2044	158·5				
	Chats	3825	110·5				
	Totals	9806	872	7·78	25·21	1·96	0·382 0·384 } 0·383

VARIETY—SCOTTISH FARMER.

Control	Ware	2966	594					
	Seed	2193	178					
	Chats	4896	163				0·354	0·378
	Totals	10055	935	7·50	21·39	1·60	0·410	
Muriate of Potash.	Ware	4227	784					
	Seed	2486	209					
	Chats	5331	180				0·359	0·353
	Totals	12044	1173	9·41	19·59	1·84	0·347	
Sulphate of Potash.	Ware	2818	657					
	Seed	2044	193					
	Chats	4829	183				0·358	0·385
	Totals	9687	1013	8·13	20·04	1·63	0·411	

TABLE II.

SHOWING RATES OF LOSS IN WEIGHT OF 100 TUBERS.

VARIETY—SHARPE'S EXPRESS.

Dates of Weighings.	Potatoes from Control Plot.		Muriate of Potash Plot.		Sulphate of Potash Plot.	
	Total Weight of Tubers. Kilograms	Total loss in Weight of Tubers. Kilograms	Total Weight of Tubers. Kilograms	Total loss in weight of Tubers. Kilograms	Total Weight of Tubers. Kilograms	Total loss in weight of Tubers. Kilograms
1921						
Aug. 26th.	7·995	—	7·995	—	8·003	—
„ 27th.	7·970	0·025	7·979	0·016	7·994	0·009
„ 29th.	7·928	0·067	7·950	0·045	7·956	0·047
„ 30th.	7·910	0·085	7·934	0·061	7·932	0·071
„ 31st.	7·900	0·095	7·928	0·067	7·920	0·083
Sept. 1st.	7·881	0·114	7·915	0·080	7·918	0·085
„ 3rd.	7·876	0·119	7·900	0·095	7·913	0·090
„ 5th.	7·852	0·143	7·885	0·110	7·891	0·112
„ 7th.	7·815	0·180	7·854	0·141	7·858	0·145
„ 9th.	7·801	0·194	7·837	0·158	7·840	0·163
„ 12th.	7·791	0·204	7·830	0·165	7·826	0·177
„ 16th.	7·779	0·216	7·818	0·177	7·820	0·183
„ 23rd.	7·763	0·232	7·803	0·192	7·805	0·198
Oct. 6th.	7·708	0·287	7·757	0·237	7·755	0·248
„ 29th.	7·611	0·384	7·698	0·297	7·693	0·310

VARIETY—SCOTTISH FARMER.

1921.						
Oct. 10th.	16·180	—	15·67	—	14·80	—
„ 22nd.	15·800	0·170	15·59	0·08	14·71	0·09
„ 24th.	15·520	0·310	15·44	0·15	14·56	0·15
„ 26th.	15·370	0·390	15·24	0·20	14·37	0·19
„ 29th.	15·280	0·420	15·03	0·21	14·17	0·20
Nov. 1st.	15·200	0·510	14·81	0·22	13·89	0·28
„ 11th.	15·060	0·610	14·45	0·36	13·47	0·42
„ 20th.	15·050	1·070	13·59	0·86	12·55	0·92

TABLE III.

SOILS OF THE EXPERIMENTAL PLOTS.

Formation : New Red Sandstone—Keuper Marl.

	Research Station, Long Ashton. Plot 8. Sharpe's Express Plot. (Surface Soil)	Research Station, Long Ashton. Plot 24. Scottish Farmer Plot. (Surface Soil)
Mechanical Analysis—	%	%
Stones in Sample	Nil	Nil
Fine Gravel	0·75	0·34
Coarse Sand	7·93	10·42
Fine Sand	52·40	36·26
Silt	10·61	10·87
Fine Silt	14·88	19·16
Clay	7·09	11·14
Chemical Analysis—		
Moisture	1·18	3·61
Loss on Ignition	5·13	7·44
Total Potash (K_2O)	0·710	0·839
Available Potash (K_2O) ..	0·0143	0·0092
Total Phosphoric Acid (P_2O_5)	0·131	0·112
Available Phosphoric Acid (P_2O_5)	0·038	0·0127
Calcium Carbonate	0·225	Contained some lime
Lime Requirement	Nil	Nil

CIDER-MAKING TRIALS—1920-21 *SEASON.*

(Otto Grove.)

Variety Tests.

During the season 1920-21 the vintage apple crop was extremely poor and it was not possible to get more than a few tons of English cider apples of rather inferior quality. Consequently it was decided to get some apples from France, where the crop was a good one. These apples were all mixed varieties from the neighbourhood of Redon in the south of Brittany, and were mostly of the sharp kinds. It would have been desirable to get some single varieties and mixed fruit from other districts, but this was not done because of the high prices demanded for single varieties and the action of the French Government in stopping the export of cider apples before fruit from different districts could be secured. The apples were shipped directly from St. Malo to Bristol, where they arrived at the end of October. Unfortunately they had not stood the transport very well and were for the most part in bad condition, very bruised and to a certain extent decayed. Many had to be

Name of Variety.	District where Grown.	Date of Making.	Specific Gravity of Fresh Juice.	Malic Acid per cent.	Tannin per cent.	Rate of Fermentation at 25° C.	Date of Filtering.	Specific Gravity May, 1921.
SINGLE VARIETIES.								
SHARP VARIETIES.								
Crab Apple ..	.. Byford	.. Dec. 15th	1·048	1·09	·18	6·6	3/1/21	1·019
White Hereford..	.. Breinton	.. Dec. 17th	1·044	·68	·17	5·2	10/1/21	1·017
BITTERSWEET VARIETIES.								
Dabinett	.. Long Ashton ..	.. Dec. 9th	1·056	·32	·24	6·4	13/1/21	1·012
Jersey	.. Breinton ..	.. Dec. 16th	1·046	·26	·18	5·2	17/1/21	1·023
Cummy Norman	.. Breinton ..	.. Dec. 17th	1·056	·26	·19	5·5	18/1/21	1·026
Royal Wilding ..	.. Ledbury ..	.. Dec. 7th	1·053	·24	·28	4·5	18/1/21	1·025
Royal Wilding ..	.. Breinton ..	.. Dec. 17th	1·052	·29	·18	3·7	17/1/21	1·030
MIXED APPLES FROM FRANCE.								
do. No. 1	.. Brittany ..	.. Nov. 1st	1·052	·68	·12	8·3	28/11/20	1·014
do. ,, 2	.. ,, ...	.. Nov. 2nd	1·052	·81	·12	7·8	26/11/20	1·013
do. ,, 3	.. ,, ...	.. Nov. 3rd	1·051	·78	·17	7·2	26/11/20	1·017
do. ,, 4	.. ,, ...	.. Nov. 4th	1·051	·80	·13	7·2	28/11/20	1·018
do. ,, 5	.. ,, ...	.. Nov. 8th	1·049	·80	·14	7·3	6/12/20	1·012
do. ,, 6	.. ,, ...	.. Nov. 10th	1·048	·82	·11	8·2	6/12/20	1·007
do. ,, 7	.. ,, ...	.. Nov. 12th	1·048	·78	·11	8·	7/12/20	1·007
do. ,, 8	.. ,, ...	.. Nov. 12th	1·048	·81	·11	8·	8/12/20	1·011
do. ,, 9	.. ,, ...	.. Nov. 16th	1·049	·84	·12	5·4	10/12/20	1·024
do. ,, 10	.. ,, ...	.. Nov. 17th	1·050	·84	·13	4·2	13/12/20	1·024
do. ,, 11	.. ,, ...	.. Nov. 18th	1·050	·83	·13	4·7	14/12/20	1·023
do. ,, 12	.. ,, ...	.. Nov. 22nd	1·046	·92	·11	5·7	15/12/20	1·024

rejected. The charges for freight were rather heavy, making the cost of apples bought in France at about £5 per ton, amount to about £11 per ton delivered at the Institute.

As the apples arrived in over-ripe condition it was necessary to make them up as quickly as possible without attempting to sort them into different groups according to the types of apples. Consequently they were made up according to ripeness, taking the ripest lots first. In all 12 lots of cider were made. As the chemical analyses show, there was not a great difference in the composition of the juices. The ciders were all of the same class: quick fermenting, sharp, rather thin and without much body, but with a pleasant flavour. They kept well in bottle, but some which had been filtered at a comparatively high specific gravity (over 1020), produced too much deposit and gave too much effervescence when the bottles were opened.

These apples were too much of the sharp class to give a cider typical of that used in Brittany, where a lower degree of acidity is preferred. In another season of scarcity it is hoped that it will be possible to experiment with different types of French cider-apples under more favourable conditions.

As regards the few single variety ciders made up from English apples, the sample of crab apples gave a very sharp, light coloured cider, which was much too sharp and thin to be of any use by itself: but a cider of this type is sometimes useful to blend with some of the heavy bitter-sweet types, especially in the case of ciders liable to go black with exposure to the air, since the addition of malic acid prevents this disorder.

The White Hereford gave a thin, rather sharp cider. Of the bitter-sweet varieties, the two Royal Wildings were very good full-bodied ciders. The Cummy Norman was fairly good, but both the Dabinett and the Jersey were below the standard for the vareties.

In the preceding table a list of the apples tested is given with the chemical composition of the juices and other particulars.

Pure Yeast Fermentation Experiments.

An experiment was made with pure yeast fermentation. The juice used was made from a small lot of mixed apples, mostly Royal Wilding and Cummy Norman. The analysis of the juice was as follows:—specific gravity 1.050; malic acid ·31%; tannin ·20%; rate of fermentation at 25°C. 6·7.

One cask as a control was left to ferment naturally in the ordinary way. In the case of the other five casks, the juice was first pasteurised by heating to 70° C. (158° F.), and then placed in freshly steamed 50 gallon casks, where it was left to cool. Each was after cooling inoculated with two litres of a culture of a specially selected type of pure yeast, a different kind being used in each case. The casks were kept in a room where the temperature was maintained at 55°–58° F.

Although the casks were kept at the same temperature and were all of the same size, there were great variations in the rates of fermentation, as will be seen from the following table.

SPECIFIC GRAVITY.

	Dec. 20, 1920.	Jan. 3, 1921.	Jan. 6, 1921	Jan. 10, 1921.	Jan. 17 1921.	Jan. 24, 1921.	Jan. 28, 1921.
Control	1·050	1·026	1·018 (filt)	..	..	..	..
Yeast 27 (Johannisberg)	1·050	1·042	1·033	1·025	1·022	1·018 (filt)	..
„ 37 (Riesling)	1·050	1·028	1·022	1·017 (filt)	..	..	..
„ 13 (Gatcombe Cider) ..	1·050	1·032	1·025	1·019 (filt)	..	..	..
„ 40 (Saké) ..	1·050	1·047	1·042	1·035	1·029	1·023	1·019 (filt)
„ 34 (Port wine)	1·050	1·041	1·036	1·032	1·028	1·024	1·020 (filt)

During the fermentations samples were taken for microscopical examinations and it was found that the yeasts added kept in a pure state without admixture of other yeasts. The samples were bottled directly after filtration and were compared for flavour and quality, after being kept in bottles for four months, the following being the observations made at the time :—

		Specific Gravity.		Order of Merit.
Control :	Cider clear with some deposit	1·016	A dry cider with moderate flavour	5
No. 27	„ „ „ „ „	1·014	Better than control Flavour cleaner	3
„ 37	„ „ „ „ „	1·013	Inferior to control. Coarse flavour	6
„ 13	„ „ rather less „	1·013	Decidedly superior to control. Best of all	1
„ 40	„ „ with some „	1·016	As control. A little cleaner in flavour	4
„ 34	„ „ rather more deposit	1·016	Better than control. Flavour cleaner	2

It will be seen that the pasteurisation of the juice and fermentation, with a pure yeast in all cases had a marked retarding influence upon the rate of fermentation. After 17 days the specific gravity of the control had fallen from 1·050 to 1·018, but in the case of yeast, No. 40, it took 39 days to reach a specific gravity of 1·019. This is partly due to the character of the different yeasts and probably also to the fact that some of the nitrogen-containing substances in the juice are coagulated by the pasteurisation and made less readily available as food for the yeasts. In all our experiments with fermentations with pure yeasts in pasteurised juices this retarding influence has been more or less in evidence.

As regards the differences in flavour, it can be said that the samples fermented with pure yeast, with one exception, had a cleaner and more wine-like flavour than the control, and there does not seem to be any doubt that the pasteurisation of the juice and the fermentation with a carefully selected pure yeast would improve the flavour of the cider. No cooked taste could be observed.

The regular pasteurisation and application of a selected yeast would bring several advantages. Firstly, as mentioned above, the retarding of the rate of fermentation, which is very desirable, as it makes it easier to produce a sweet cider: and secondly, the elimination of disorders like sickness and ropiness and to a certain extent acetification. The micro-organisms causing these disorders are killed by the heat used for the pasteurisation, and consequently the maker has only to see to it that the fermentation-vats are sterilised, before the pasteurised juice is admitted, to prevent any infection with undesirable micro-organisms.

When fermenting cider in the ordinary way, a certain number of yeasts, torulae, *Sacch. apiculatus* types and other micro-organisms are more or less active during and after fermentation and make the control of the fermentation and the keeping quality of the cider rather uncertain, as they are influenced by many different factors. If the juice is pasteurised at the proper temperature it should be sterile, and consequently there would only be two principal factors to take into consideration in the making of the cider, namely, the quality of the juice and the character of the pure yeast used. Both these factors are largely under control, and it would be possible to produce any desired type of cider, with much greater security and facility than when working under ordinary conditions, with a juice containing a great number of more or less desirable organisms influencing the fermentation of the juice and the keeping quality of the cider.

The pasteurisation of the juice as it comes from the press is not difficult or costly to carry out. There are several forms of continuous pasteurisation apparatus on the market, and the use of one or other of these would make the method practicable on however large a scale it might be desired to conduct it.

STUDIES ON ROOT DEVELOPMENT.

(B. T. P. Barker.)

The account given in the Report for 1920 of root formation in newly planted trees showed that, in the case of apple trees worked on the English Broad-leaved Paradise stock (Malling Type 1) and grown under the local conditions of soil and climate at the Research Station, the young tree after transplantation produced practically an entirely new root-system, whether that existing at the time of transfer from nursery quarters was retained uninjured as far as possible or subjected to root pruning of various degrees of severity. The conclusion was drawn that under the conditions specified this behaviour was normal for root stock types which were able to form adventitious roots freely, aeration being a dominating factor in determining the actual points of origin of the new roots. The scheme of experiments from which these results were obtained was so arranged that for each of the first five years after the plot was planted there would be available for lifting a batch of thirty trees hitherto untouched since the time of planting, thus making it possible to follow the successive stages in root development. Since it was considered probable that there would arise out of these periodic examinations points which required further investigation, it was decided to include any such new lines of work thus opening up as a part of the general investigation and as far as possible to start them as they occurred without waiting for the completion of the initial programme. Certain points requiring such supplementary investigation were suggested by the results of the first year's root examination, and work upon a few of them was begun a year ago. It is proposed to deal in this article with some of these developments as well as the results of the second year's root examination under the original scheme, since all are more or less directly connected, and to treat it as a progress report on the whole subject.

A.—THE SECOND YEAR GROWTH OF THE ROOT SYSTEM AFTER TRANSPLANTATION.

The results of the examination of the root-systems of the second batch of trees due to be lifted, according to the original scheme, during the winter 1921 22, *i.e.*, at the end of the second season of growth after planting, accord in all respects with expectations based on the results observed for the trees lifted after one season's growth only which were recorded in last year's Report.

It may be recalled that the trees at the time of planting were divided into five groups, according to the method of treatment of the root. Each group in turn was subdivided into two, in the one case the shoots being pruned at the time of planting and in the other such pruning being omitted. The treatments of the respective groups were as follows :—

Set I. Root fibres retained : tree unrammed : branches pruned.
„ II. „ „ „ tree unrammed : branches unpruned.
„ III. „ „ „ tree rammed : branches pruned.
„ IV. „ „ „ tree unrammed : branches unpruned.
„ V. „ „ removed : tree unrammed : branches pruned.
„ VI. „ „ „ tree unrammed : branches unpruned.
„ VII. „ „ „ and roots cut : tree unrammed : branches pruned.
„ VIII. „ „ „ and roots cut : tree unrammed : branches unpruned.
„ IX. Root reduced to short stump : tree unrammed : branches pruned.
„ X. „ „ „ „ „ tree unrammed : branches unpruned.

Since in all the groups the main result as regards the production of new roots was substantially the same, viz., that a new root-system was produced in the collar region of the tree, little growth taking place elsewhere, it was not anticipated that the additional year's growth would show any marked difference in the progress of root development as between one group and another. So uniform in general character have the results proved to be that one description holds good for all cases.

In general the roots formed during 1920 merely continued the growth in a centrifugal direction from the bole of the tree. The new growth of 1921 was usually partly terminal and partly in the form of new lateral branches of different degrees of strength. Unlike the 1920 results, there was not as a rule much actual new root growth springing from the collar of the tree, the main effort being clearly the extension of the previously formed root-system. Growth in thickness as well as length had occurred, but the behaviour in this respect was curiously variable. Sometimes the 1920 roots were found to have thickened fairly evenly, the root-system then being well-balanced. In other trees the thickening of individual roots varied very greatly, some remaining almost mere fibres, and others becoming relatively coarse and fangy. Where this had happened, there was a tendency for a few of the roots to outstrip the remainder markedly, this leading generally to a pronounced want of balance in the root-system as a whole. It was very noticeable that, where this occurred, almost invariably there was a corresponding lack of balance in the branch system of the tree. Where the branch system had developed more on one side of the tree than the other, on the former side would be found one or more roots growing much more strongly than any of the remainder. This suggests a relation between natural direction of shoot and root growth associated with a corresponding direct link of the vascular tissues, a point which has sometimes been discussed by growers: and the matter appears worth following further in view of its bearing on the shaping of trees.

The individual sets of trees thus far lifted for examination lend support to the view that the scion variety exercises a material influence upon the root-system. For example, the relatively vigorous Allington Pippin has produced trees with roots coarse and lacking in fine fibre as compared with those resulting from the weaker Stirling Castle, the English Broad-leaved Paradise being the root-stock type used in both cases.

There are only two further features observed which appear noteworthy. The one is the continued relative inactivity of the original root-system away from the collar region, an occasional active root of fair strength being found but in no case any material amount of new root formation. The other is the nearly horizontal course taken by the actively growing roots, which conforms with the observation on root spread of older trees recorded in another article of this Report. Under Long Ashton soil conditions it is evident that rooting is mainly confined to a zone within a foot or so of the surface.

B.—THE SECOND YEAR SHOOT GROWTH AFTER TRANSPLANTATION.

No consideration was given in last year's Report to the shoot growth of the trees during the season immediately following transplantation, the facts that some of the trees were tipped at the time of planting and the remainder unpruned and that measurements of growth made during the time when the tree is establishing itself are apt to be misleading, making any comparison at that stage premature. The trees were all winter-pruned at the end of the first growing season as uniformly as the growth of the individual trees would permit. Growth measurements for the second season have been recorded. These are shown in the appended tables.

Although the figures for individual trees do not always vary in the same direction according to the method of root treatment, the averages appear to be sufficiently marked to allow tentative conclusions to be drawn. These, of course, cannot be taken as established until and unless confirmatory evidence is forthcoming from the growth during subsequent years: detailed discussion is best deferred, therefore, until more statistics are available.

The first conclusion is that shoot growth of the established tree is relatively little affected by the nature of the root treatment given at the time of planting. There are 30 trees in each group subjected to the same form of root treatment and the average result per tree in each, whether 1921 shoot growth or girth is taken as the criteron, shows no wide differences from the others.

The second conclusion is that the average effect of tipping the shoots at the time of planting, whatever the manner of treatment of the roots, is an appreciably greater amount of new shoot growth during the second season and, to a lesser extent, an increase in girth as compared with non-pruning.

The third conclusion is that while there is a tendency for a greater number of buds to grow out into new shoots in the case of the trees treated normally at the time of planting, the average individual length of such shoots is materially less than in any of the other cases. The difference is sufficiently marked to call for notice and the circumstances do not suggest it being a chance result. Whether or not this feature is of ultimate detriment or benefit to the tree time alone can show.

Considering the wide differences in root treatment, the absence of any great variation in the average amounts of new shoot growth would have been very surprising had not the results of the examination of the 1920 root growth, showing that in all cases a new root-system was produced, prepared for this. For the case of the particular root-stock type used in these trials (the English Broad-leaved Paradise) Pickering's view that it is unnecessary when planting a tree to take care to preserve the finer fibrous roots is thoroughly confirmed. Whether one can go a step further and contend that the removal of those roots is beneficial is a point which calls for more investigation. The shoot growth figures here quoted support that idea, especially in the cases where the trees were pruned at the time of planting, but the difference in favour of fine root removal is not sufficiently marked to justify a conclusion of that sort without confirmatory evidence from other trials. The more drastic treatment of removal of the coarser branch roots as well as the finer fibrous material is, according to the figures, somewhat too extreme, although it cannot be said to have seriously hindered the growth of the tree.

The results which are most difficult to interpret are those of the total shoot growth of the trees rammed at the time of planting.

The experiments of Pickering on ramming at Woburn and several other centres indicated that such treatment produced increased shoot growth, especially marked in the second season following planting. The trials under consideration fail to confirm those results, and it may be mentioned here in passing that two previous trials on ramming made at Long Ashton, hitherto unrecorded, have similarly failed. It is, however, very curious to find that, although the shoot growth of the rammed trees pruned when planted is relatively very much below that of all the others similarly pruned, it is higher for them when unpruned at planting than any of the others in the unpruned series.

Before passing from this part of the subject reference should be made to the nature of the weather conditions during the season following the planting of the trees. The latter were not planted until March, 1920. Dry conditions prevailed until the middle of June, after which the remainder of the growing season was decidedly rainy. The late planting followed by several weeks of drought cannot be regarded as favouring the treatments involving more or less severe root mutilation. Indeed, the trees in those groups probably were handicapped somewhat by the weather conditions; if so, the features to which attention has been directed would presumably be intensified in an average season rather than the reverse. An even more trying season was experienced in 1921, when the drought was practically continuous throughout, and its effects were marked on the new series of root treatment experiments to which reference is made in a subsequent Report. The point it is desired to emphasise is that the results in such trials must be affected to some extent by the weather, repetition being therefore desirable to eliminate the factor of weather influence.

SHOOT TREATMENT.	ROOT TREATMENT.				
	Fibres retained : tree unrammed.	Fibres retained : tree rammed.	Fibres removed : tree unrammed.	Fibres removed and root cut : tree unrammed.	All roots except stump removed : tree unrammed.
	AVERAGE NEW SHOOT GROWTH PER TREE IN MILLIMETRES.				
(*a*) Pruned when planted ..	7,782	6,706	8,638	7,734	7,418
(*b*) Unpruned when planted	5,263	6,118	5,771	5,850	5,440
Average (*a*) and (*b*) ..	6,523	6,412	7,205	6,792	6,429

AVERAGE GIRTH AT 1 FOOT ABOVE GROUND LEVEL PER TREE IN MILLIMETRES.

(*a*) Pruned when planted ..	80	75	81	75	72
(*b*) Unpruned when planted	67	73	68	71	67
Average (*a*) and (*b*) ..	74	74	75	73	70

AVERAGE NUMBER OF NEW SHOOTS PRODUCED PER TREE.

(*a*) Pruned when planted ..	21	16	19	18	19
(*b*) Unpruned when planted	16	12	12	13	13
Average (*a*) and (*b*) ..	18.5	14	15.5	15.5	16

AVERAGE LENGTH OF NEW SHOOTS PER TREE.

(*a*) Pruned when planted ..	362	409	464	430	389
(*b*) Unpruned when planted	304	507	498	464	404
Average (*a*) and (*b*) ..	333	458	481	447	397

C.—ROOT DEVELOPMENT DURING THE GROWING SEASON.

As a part of the general investigation on the influence of the root-system upon the growth and behaviour of the tree the question of the time and rate of root growth during the growing season obviously arises. When the work on the behaviour of the root-system following the transplantation of the tree was started, the general description and first results of which were recorded in last year's Report, an attempt was made to observe directly the course of root growth ensuing after the different methods of treatment of the root-system previous to planting. The trees were grown under the water culture method, which permitted a general view of the roots as required. The article referred to contains an account of the observations made, these sufficing to show the positions in which new roots originated but little else to which any importance could be attached on account of the obviously unfavourable conditions for root growth under that method of culture.

A further attempt was made during the 1921 growing season on different lines, which proved much more satisfactory. The head was removed from a 30-gallon cask, which was placed on end, and the trees to be kept under observation were suspended above the opening in such a position that the roots hung within the cask a foot or so below the rim. A sprinkler arrangement was inserted in the centre, attached to a siphon kept regularly supplied with a nutrient culture solution. At regular and frequent intervals—about every three to five minutes—a fine spray was produced within the cask by this device and the roots were so placed that they were well moistened by it. In this way they were kept constantly wetted with a nutrient solution and never allowed to become dry, while at the same time by being suspended in air they were much better aerated than if immersed in liquid. The excess fluid drained freely from them and collected at the bottom of the vessel, from which it was removed at intervals before it reached the level of the roots. It was possible to deal with six trees in one cask, those being three-year-old Bramley's Seedling and Lane's Prince Albert apples worked on Paradise stocks of the Malling types III and V. The experiment was started in April and continued in regular working order until December. The method being under trial for the first time no attempt was made to take quantitative measurements of the rate of root growth in view of the probability of adjustments being necessary from time to time to secure more efficient working. In point of fact few adjustments were needed and the results for a first trial may be considered very fairly satisfactory. Weaknesses were disclosed during the course of the season which will need to be remedied in future trials if growth equal to that of trees grown in soil or sand pot cultures is to be obtained: but, except for the amount, there is no reason to think that the general course of either root or shoot growth obtained differed in character from that occurring under the latter conditions. The method is certainly much superior to the water culture method for apple trees and, if leaf appearance may be taken as a guide, is capable of promoting healthy and practically normal growth.

Since it is proposed to take detailed records of the rate of root growth during the coming season and definite data will accordingly be available for consideration, it would be premature here to do more than describe generally the main sequence of events as observed. The beginning of new root formation was visible towards the end of April, before the opening buds had expanded. The new roots were formed at various places on the old root-system and not confined to any particular region. During the next few weeks they increased relatively rapidly in length and fresh ones made their appearance frequently. Then followed a phase extending over midsummer until well into July, during which both extension root growth and new root production was comparatively quiescent. This gradually was succeeded by a more active period again, which was maintained until the conclusion of the season's observations some time after leaf-fall. This late summer and autumnal root activity was very marked and by far the greatest increase in root length throughout the season occurred during that part of the year. Stated in relation to shoot growth there are three well defined phases during the growing season. The first, which is not of long duration, is marked by rapid root and shoot growth occurring simultaneously. This gradually passes into the second, during which shoot growth is still active and root growth relatively inactive, a condition which is, perhaps, most marked about midsummer. Later, as shoot growth slackens, root activity greatly increases, the balance between the two in this third phase being directly the opposite of that obtaining during the second.

In this connection a further series of observations may be recorded, since they appear to bear very closely on this question of the relation between root and shoot development and are very suggestive as to the processes going on within the plant causing this relation. They arose from experiments on the effect of ringing on the growth of black currants, which were made in the first instance as a part of another entirely distinct investigation which need not be considered here. In these experiments, which were conducted on two-year-old black currant plants grown in pots in sand, in some cases with and in other cases without the addition of nutrient solution, a ring of bark about ⅓ of an inch in width and extending as deeply as the wood was removed from the main stem of each plant brought under treatment, just as in the ordinary operation of "girdling" or "ringing," which has been described in the Annual Report for 1919, in the article dealing with "Notching and Ringing of Apple Trees." The inner tissues of the shoot exposed by the ring, together with the parts of the stem immediately above and below, were kept moist after ringing by being wrapped loosely with a small cover of cotton wool kept constantly damp by a regular drip of water from a vessel situated immediately above. In each set of experiments other plants were used as controls, these being unringed but otherwise similarly treated as regards the moistening of the zone of the stem corresponding to the position of the ring in the other cases. The experiments were started in April, 1921, about the time when the plants were coming into full leaf and before much actual shoot growth had taken place. They were conducted in a cool greenhouse. The point of interest here being the root growth which occurred in the neighbourhood of the ring as a result of the moist conditions maintained in that region, no detailed attention need be given to the behaviour of the plants in respect of shoot growth.

The ringed plants by the end of ten days were showing much activity in the way of adventitious root production in the neighbourhood of the ring. Immediately below the ring and bursting through the tissues of the bark of the stem kept moist by the water drip the growing points of many roots were plainly visible, these being easily distinguishable by that time from the tissue out-growths of the lenticels which also occurred simultaneously under such conditions and which a few days earlier were not sufficiently developed for their nature to be determined with confidence. Just above the ring, but a few days later than those below, other roots similarly arose. In the case of the unringed control plants no roots developed in the moistened region until three weeks after the experiment was started. By that time the new roots of the ringed plants had in many cases grown to over an inch in length. Production of these adventitious roots only occurred in the zone of the stem kept moist by the cotton wool wrapping, this applying both to the ringed and unringed plants and showing that moist conditions are necessary.

As soon as these results were obtained a corresponding set of experiments was started with a fresh batch of plants, these in point of time being thus about a month later in the growing season than the first. The treated plants were similar except that they were, of course, a month more advanced in growth, appreciable shoot growth having taken place. In this instance the results differed widely from the former. While in the case of the controls new roots first appeared in practically the same time as before, those formed on the ringed plants were in this instance not more than a day or two ahead and were confined exclusively to the zone above the ring, none appearing below.

Thence onwards until the end of the growing season similar series on other plants held in reserve were started as soon as the complete results from the immediately preceding set were available. For the sake of brevity a detailed description of each will be omitted, the individual results being so definitely graduated in character and corresponding to a general type that they can as well be considered *en bloc* as separately.

The behaviour was as follows. Until September the unringed plants produced roots in approximately the same time as in the original set, viz., three weeks, there being but a few days difference in the time taken for the appearance of the earliest roots in any set. In the set in progress at the beginning of September, the time taken was longer, four weeks being required, and in addition the number of roots and the amount of growth was distinctly less. In the following series, started September 20th, which proved to be the last of the season, although the drip treatment was continued until November, no roots were formed.

The ringed plants on the other hand, while taking approximately three weeks to show the earliest signs of root formation in the respective series in progress during May, June and early July, exhibited marked acceleration in the subsequent series. The July, August, and early September sets gave root appearance in seven days, and even the last set of the season, beginning as stated in the previous paragraph on September 20th, yielded roots in ten days, notwithstanding that by that time defoliation was proceeding and shoot growth had long since ceased.

Adventitious root formation in the case of these ringed plants thus follows very much the same course as the root growth noted with the apples. It is rapid in the early part of the season, slows down markedly till midsummer and then increases for the latter half of the growing season, till it is as free as in the initial period. The unringed plants differ in that root development is slower in the first instance, remains approximately the same throughout the growing season until leaf-fall begins, when it slows down and finally ceases altogether.

The significance of these results may now be considered. It is suggested that they are correlated with the circulation of organic food reserves within the plant. At the beginning of the growing season the amount of these available is relatively large, representing the accumulation from the previous season's activity. They are distributed throughout the tree and are available, therefore, in the neighbourhood of any centres of growth which may become active. Hence at that period both shoot and root growth can be sustained simultaneously until they are exhausted. When that happens, the plant becomes dependent on fresh material manufactured in the leaves. The observed facts recorded show the continuance of shoot growth without serious check for some weeks and the reverse for root growth. The inference is that the food elaborated in the leaf is supplying the former at the expense of the latter, presumably owing to its closer proximity. This condition, however, cannot be expected to last indefinitely, since the plant depends on the root for its water requirements and all raw food materials except carbon dioxide; continued shoot growth and leaf development unaccompanied by equivalent root growth must tend to lead to shortage in those respects and to a slackening of aerial growth. This is turn would involve a higher concentration of organic reserved and higher osmotic pressure in the neighbourhood of the leaves, since photosynthesis is constantly proceeding in the latter. The diminished shoot growth then no longer can utilise all, while the water supply is limited, and the excess is probably largely translocated downwards towards the roots, which in due course show growth increase as a result.

It is in this connection that the experiments with the ringed currant plants seem particularly instructive. The removal of the ring of bark makes a break in the continuity of the phloem tissues, which are regarded as the main channels for translocation of organic reserves within the plant. In the early part of the growing season adventitious roots were formed below the ring, indicating the accumulation of reserves at that point by the interruption in the upward flow, which is supposed to take place when the season's growth begins. The later series did not show this root production below the ring and the presumption is that such reserves were by that time exhausted. Root production above the ring then occurred instead, pointing to an interrupted flow of reserves coming from above downwards. At first growth there was slow, suggesting very limited supplies: later it increased rapidly implying a greater stock of available reserves. With the unringed currants no such break in the circulatory system was provided; hence the passage of materials past the moistened zone of the bark was uninterrupted and no accumulation occurred there. This probably accounts for root production in these cases being invariably slow and also for the time taken for it being practically uniform throughout the season.

From the beginning of July onwards various supplementary experiments with ringed currant plants were made with the object of ascertaining the manner in which the results would fit in with the ideas above suggested as to the presence and circulation of reserves within the plant during the growing season. The following results appear to have some bearing on the point.

(*a*) Ringed plants grown in sand kept moist with nutrient solution gave more vigorous adventitious root development than others in sand supplied with water only, especially when a drip of nutrient solution was used instead of the water drip. Generally also the first adventitious roots were formed slightly quicker in the former case. In that case the supply of nutrient solution is doubtless responsible for a greater production of organic material by the leaves, which in turn is reflected in the greater root growth.

(*b*) Similar ringed plants kept during July in darkness from the time of ringing formed only a very few weak roots and these were slower in making their appearance than in any other case. The prevention of carbon assimilation by the absence of light is the cause to which this result must be attributed.

(*c*) A very similar result to that recorded in (*b*) was obtained when all leaves were removed from ringed plants at the time of ringing. These trials were made during July and the plants kept in a greenhouse. By the time roots appeared a small amount of new shoot growth with accompanying young leaves occurred, this not being removed as formed. The root development was somewhat stronger than in (*b*) and was a few days earlier in first appearance, although more than a week slower than with ringed non-defoliated plants. Absence of photosynthesis may be regarded as the cause of the difference in behaviour between the defoliated plants and the latter.

(*d*) Complete removal of all shoots during the current season in addition to defoliation, these being cut right back to the one year old wood at the time of ringing, resulted generally as in (*c*), but with slight acceleration in time or root formation. No appreciable amount of new shoot growth occurred within that period, and possibly this accounts for the rather shorter time required for root production, all the reserves available at the time of ringing being available for the latter.

In spite of the fact that the whole of these observations on currants are concerned with adventitious root production under a very special form of treatment and, therefore, are not directly comparable with those recorded for the apple trees, there is such close correspondence in the results as to the degrees of root activity during the various periods of the growing season that they may fairly be considered as intimately related and probably indicative of a general rule applying at least to deciduous shrubs and trees.

While suggesting that the phenomena of root growth during the growing season are associated directly with the circulation of reserves within the plant and that the rate of such growth is closely correlated with the available quantity of these substances, it is recognised that there are many points which require more detailed consideration than space will permit here and that supplementary evidence in various directions is needed before these views can be considered established. The present article, however, does not purport to be more than a progress report; it is hoped that further work now in hand will justify a more complete discussion in due course.

CANKER CONTROL TRIALS.

(*S. P. Wiltshire.*)

Concurrently with the investigations in progress on apple canker, in relation to the problems of mode of entry of the fungus into the tree, the sequence of events after entry and the conditions affecting the degree of resistance of the host, annual spraying trials are also being conducted. The results of the work under the former head, ready for publication, have recently been described in a paper contributed to the Annals of Applied Biology (Vol. VIII, Page 182, Nov. 1921), and the present note is, therefore, concerned solely with the results of the spraying trials made during 1921.

The trees used for the main experiment were again the highly susceptible Kingston Black and Medaille d'Or seedlings. Owing to the fact that infection of the 1919 wood did not take place until as late in the winter season as the end of March, 1920, the spraying in the following winter trials, was delayed until 3rd February, 1921, when a first spraying was given with copper stearate. By the end of March, 1921, only ten leaf scar infections had occurred and consequently a second spraying with Burgundy mixture was given on April 1st, 1921.

The method adopted in these trials was rather more exact than that of the previous experiment. One hundred vigorous shoots formed in 1920 were selected and labelled, twenty shoots being selected on each of five trees. Ten shoots on each tree were sprayed and ten left unsprayed. The latter were covered with newspaper while spraying was in progress and thus protected from any spray fluid which might otherwise have fallen on them in spraying the other ten shoots. These temporarily covered shoots naturally served as controls. Counts were made on 31st March, 1921, 19th August, 1921, and again on 23rd January, 1922. The final results were as follows :—

TREE.	UNSPRAYED.	SPRAYED.
1	2	1
2	3	2
3	2	6
4	0	2
5	2	5
	9	16

The count on 19th August, 1921, gave two cankers less, one on a control branch and one on a sprayed branch.

The first fact to notice in connection with results is the small number of infections compared with those of previous years. The figures of the spraying given in last year's report were 179 on the sprayed and 500 on the unsprayed branches, and whilst these figures are not actually comparable as they refer to a smaller number of larger branches than used in this year's experiment, they suffice to show that leaf scar infection was general as it has been each spring for a number of years on these trees. The reason for the small infection of 1921, was probably the very dry summer experienced in that year. Many observations point to the fact that canker is much more serious under wet conditions than under dry ones. In the eastern part of England, where the rainfall is considerably less than in the west, canker is not nearly so prevalent, and in Ireland, where the climate is even wetter than in western England, such a resistant variety as Bramley's Seedling becomes subject to canker. Reference may here be made to some experiments carried out some years ago to determine the effect of soil moisture on the incidence of canker.

Six pot plants, four of Allington Pippin and two of Lord Suffield were inoculated through deep wounds, each in 15 places, with conidia of *Nectria galligena*, Bres. Two trees of Allington Pippin and one of Lord Suffield were given excess of moisture by immersing the pots in buckets containing water. They were taken from the buckets and allowed to drain for one hour each day. The remaining three trees were placed on the surface of the soil in the same plot and given a little water each day. Pieces of wood prevented any rain from reaching the soil in the pots. The inoculant used only contained a comparatively small number of conidia, the object of this being to intensify any effect on the infection which the treatment of the host might produce. The experiment was started on 30th July, 1915, and the following results were obtained by 31st August, 1915.

VARIETY.	WET.		DRY.	
	Successful Infections.	*Average length of Canker.*	*Successful Infections.*	*Average length of Canker.*
Allington Pippin ..	11 out of 15	2·9 cms.	7 out of 15	1·2 cms.
Ditto ..	15 ,, ,, 15	2·1 cms.	4 ,, ,, 15	1·6 cms.
Lord Suffield ..	Tree died.	——	6 ,, ,, 15	1·6 cms.

From this one gathers that the number of successful inoculations is increased by wet conditions of the soil and that the growth of the fungus in the tissues is more rapid in the case of trees growing in a wet soil. What part a wet atmosphere has on the infection of canker has not been determined, and it is probable that this is even more important than wet soil conditions.

The only other point calling for notice in connection with the spraying trial mentioned above, is that the cankers on the sprayed branches were more numerous than those on the unsprayed. In view of the abnormally low figures obtained in either case as compared with previous years it is exceedingly doubtful if any significance should be attached to the 1921 results, in respect of the utility of winter spraying. The probability is that the weather conditions did not permit of a real test: and with them apparently affecting the extent of natural infection to so marked a degree, it is clear that a decision as to the efficacy of this method of control can only be arrived at after trials conducted over a series of years.

In addition to the spraying trial mentioned above, another was made on a large scale in a plantation of young bush apples. Three rows were sprayed with Burgundy Mixture on December 23rd, 1920, and three left unsprayed. Each row consisted of 20 trees of 20 different varieties, each variety being arranged crosswise across the plot. Counts made in November 1921, gave the following figures, omitting any cankers on the 1921 wood :—

		Total.	*Leaf scar infections*	*Canker imperfectly cut out previous winter*	*Other types of infection*
Sprayed	Row 1 . . .	7	4	—	3
	„ 3 . .	12	3	8	1
	„ 6 . .	15	4	9	2
		34	11	17	6
Unsprayed	Row 2 . .	19*	15	4	
	„ 4 . .	14	5	5	4
	„ 5 . .	21†	5	3	13
		54	25	12	17

* 12 on one tree, 5 on another.
† 17 on one tree.

The number of leaf scar infections was again small in comparison with what one would expect in a rainy season. One striking feature was the large number of cankers which developed from old cankers which had been imperfectly cut out. Before the experiment started the whole of the cankered material was very carefully removed from the trees and the wounds covered over with tar. In many instances the tar coating had remained, although canker had developed and the probability was that the infected material had not been completely removed. This emphasizes the necessity for thorough treatment in cutting out cankers, the only really sound plan to go upon being to cut well into the healthy wood to ensure complete removal of the fungus.

The figures themselves are not sufficiently regular for much significance to be attached to them. The marked susceptibility of one particular variety stood out strongly as compared the with others, the single tree of this variety in row five bearing 17 cankers, whilst the remaining trees of the row bore only four. The practice of trying spraying trials on mixed plantations of many different varieties is open to serious objections and one feels that much more valuable and reliable information can be obtained by the method adopted in the main trial described above, than by larger field trials with mixed varieties in which many factors come into play and tend to obscure the real result.

THE MICHAELMAS DAISY DISEASE.

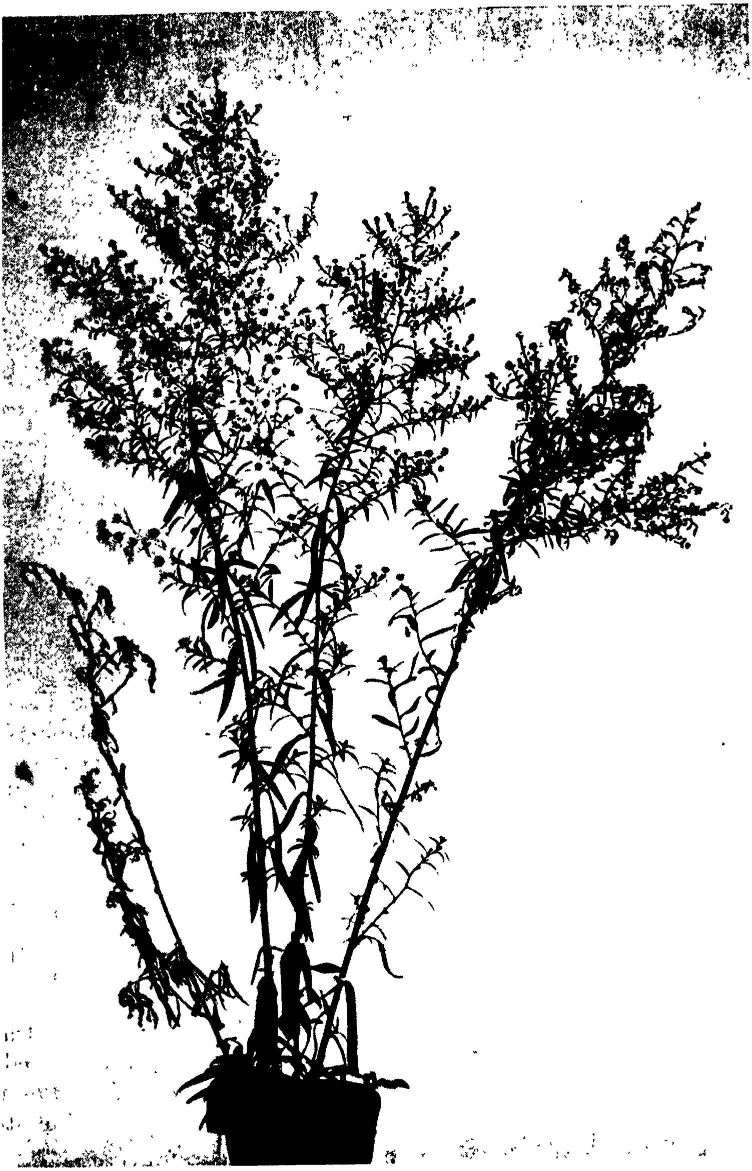
(S. P. Wiltshire.)

This disease, the causal fungus of which was first isolated at this Station in July, 1920, has been the subject of further limited enquiry during the past summer. A number of inoculation experiments have been carried out, the details of which are as follows :—

During the winter of 1920–21, Michaelmas Daisy plants were potted up and placed in a green-house. Between 19th October, 1920, and 8th November, 1920, five inoculations were made through wounds and five similar wounds were left untreated to act as controls. Two of the inoculations were cut on 24th November, 1920, when they were 36 days old and neither showed any sign of infection. Throughout the spring of 1921, none of the three remaining inoculated shoots showed any signs of the disease, but in August, 1921, two of them were found to be dead and infected with a vascular fungus.

The next experiment was carried out on six Michaelmas Daisy plants in pots. The fungus used was the original strain isolated in 1920. The method of inoculation was to transfer portions of the mycelium to wounds made in the stem. The outside of the stem was first cleaned and sterilised by washing and flaming, and cuts were then made by a scalpel, which was kept in alcohol and flamed before use. After inoculation raffia was tied finally round each wound in

Fig. 1.



ARTIFICIAL PRODUCTION OF WILT DISEASE OF MICHAELMAS DAISY.

order to keep it clean and as moist as possible. Only main shoots about 18ins. high were chosen for experiment and the wounds were made about 6ins. from the ground. Control shoots were treated exactly the same as inoculated ones except that no inoculant was placed in them. Ten inoculations were made on 8th June, 1921, and a similar number of controls as inoculations were made on each plant. Twenty-one days later no definite signs of disease were visible, although some of the leaves on the inoculated shoots showed slight signs of scorching. On the 9th July, 1921, the lower leaves on the inoculated shoots were turning reddish yellow in many cases, and on the 13th September, 1921, the following records were made. Each one of the control shoots was healthy. Some of the infections were much more advanced than others, the most backward simply showing two leaves withering at their tips, whilst the most advanced showed practically the whole shoot dead and young healthy shoots springing up from the base. A photograph of one of the plants used in the experiment is given in Fig. 1. The two outer shoots were inoculated and both showed marked signs of the disease, the left one being quite dead. The two central shoots were controls and remained quite healthy. The photograph was taken on the 10th October, 1921—four months after the inoculations were made. Towards the end of the summer three out of the ten control shoots became infected with the fungus and finally showed well defined symptoms of the disease. The manner in which these control shoots became infected is open to some doubt, but probably the conidia arising from the inoculant used in making the inoculation was carried to the wounds of the controls. The stock plants used for the experiment were derived from plants grown in the Station for years and which never previously showed signs of the disease. In making the wounds every care was taken to keep them as sterile as possible, as described above.

The course of the disease as shown by the inoculated shoots was as follows :—The first signs of successful infection was shown by the leaves on the main stem of the inflorescence and these turned an unhealthy colour with a blackening and drying at the edges. The withering then usually occurred on some of the leaves of the flowering shoots. Frequently the affected shoots were confined to the side of the inflorescence above the inoculation. Affected shoots gradually became more and more browned and dried up until the whole was completely dead. Young shoots then sprang up from the base in exactly the same manner as occurs in the naturally infected plants.

Portions of the stems inoculated in this experiment were finally placed on agar in Petri dishes and a fungous mycelium developed similar to that which was used in the inoculations.

The third experiment consisted of ten inoculations and ten controls and were made in an identical manner with the second experiment, except, that the inoculations were made later in the season, viz., 29th August, 1921—2nd September, 1921, and also small branches of the inflorescence were treated instead of the main stem. The strain used was a recent isolation from diseased material. On the 16th September, 1921, viz., after 18 days incubation, the first signs of disease were noted, the large leaves on the main stem dying off. On the 10th October, 1921, each of the inoculations could be clearly distinguished from the controls, with the exception of one control, which showed slight yellowing. The final result obtained on 10th November, 1921, showed ten of ten inoculations being successful, whilst two out of the ten controls showed slight symptoms. The infection of the controls was again a disturbing factor and shows how readily infection of suitable wounds can take place.

The results of these inoculation experiments show that the fungus isolated is probably the causal organism of the disease. Only one kind of fungus has ever been isolated from Michaelmas Daisies affected with the disease here treated of and there has been no difficulty in obtaining it. The naming of this fungus has not been carried out as it was decided first of all to establish its pathogenicity.

In a recent paper by Dowson to the British Mycological Society, a report of which appeared in the " Gardeners' Chronicle " for February 11th, 1922, a reference is made to the fact that the fungus isolated by him from diseased Michaelmas daisies apparently differs somewhat from the one isolated at Long Ashton. The original culture received from Mr. Dowson in exchange for the Long Ashton strain was proved ultimately to be non-pathogenic, whereas the second isolation received from him resembles very greatly the one isolated at Long Ashton, although further cultures will be necessary to establish the identity.

Fig. 1. A Michaelmas Daisy artificially infected with the disease fungus in the two outer shoots, the two central control shoots remaining healthy.

XVIII.—ANNUAL REPORT OF THE CONSULTING CHEMIST.

(*Dr. J. A. Voelcker, M.A., F.I.C.*)

During 1921, thirty-seven samples, as against the twenty of 1920, were sent to me by Members of the Society for analysis.

The list is as follows :—

Linseed Cake	8
Cotton Cake	3
Fish Meal	2
Sharps	1
Maize Germ Meal	1
Dairy Meal	2
Lime	4
Chalk	2
Basic Slag	5
Superphosphate	3
Sulphate of Ammonia	1
Kainit	1
Creosote	1
Soil	1
Water	2
Total	37

LINSEED CAKE.

For a considerable time past there has been little to complain of as regards the purity of Linseed Cakes. Indeed, it has been exceptional to find an impure one. Of late, however, I have noticed that the quality has not been so satisfactory in this respect as before, for I have recently come across several instances in which seed has been used which has not been as well screened as should have been the case.

This has shown itself in the presence of Weed Seeds and excessive Sand, while occasionally, such poisonous seeds as Castor Oil Bean have been found also.

Out of the eight samples of Linseed Cake sent me during the year, no less than five were, for one reason or another, unsatisfactory.

	A.	B.	C.
Moisture	10·61	10·38	11·45
Oil	12·54	8·65	10·32
Albuminoids	30·12	28·18	29·06
Carbohydrates, etc.	33·79	36·02	36·53
Woody Fibre	6·65	8·92	6·79
*Mineral Matter	6·29	7·85	5·85
	100·00	100·00	100·00
Nitrogen	4·82	4·51	4·65
*Including Sand		2·32	

A was a rich and pure Cake.

B was not of high quality and contained excessive sand.

C was not made from well-screened seed, but had an excess of weed seeds. This case led to a good deal of correspondence illustrating what I have so often pointed out, viz., that analytical figures alone are not a test of purity. The vendors did not agree with my report in this case, and suggested that, if there had been an excess of weed seeds, there would have been a shortage of Oil and Albuminoids, and an excess of sand. I replied that this would not necessarily be the case, for weed seeds themselves contain both Oil and Albuminoids, and there is no reason why weed seeds should have more sand than other seeds if equally well-cleaned. A Linseed Cake containing Castor Oil Bean would give just as good an analysis as one that contained none; the analytical figures need supplementing by microscopical analysis, in order to determine the question of purity.

In two other instances Linseed Cakes were sent me which should have been cleaner than they were.

In yet another instance, that of the sale of "Spanish Linseed Cake," the whole of a herd of pedigree dairy cows feeding on the cake had been affected. One cow died and others lost condition.

On a sample of the Cake being submitted to me, I found that it contained a considerable amount of Castor Oil Bean, and to this was due, no doubt, the trouble experienced.

It is only fair to say that the vendors made a most liberal allowance to the purchaser, compensating him for all his losses.

COTTON CAKE.

All three samples—these being of Undecorticated Cake—were of good quality. One of them, the analysis of which is here given, was of unusually high quality :—

Moisture	11·41
Oil	6·25
Albuminoids	19·68
Carbohydrates, etc.	38·20
Woody Fibre	19·81
*Mineral Matter	4·65
	100·00
Nitrogen	3·15
*Including Sand	·06

FISH MEAL.

This material appears to have come into use to a considerable extent for feeding purposes.

There is a general belief that excess of Oil or Salt is undesirable, and it is common for a guarantee to be given that the Oil shall not exceed 5 per cent. nor the Salt 4 per cent.

The analyses of the two samples sent me were as follows :—

	per cent.	per cent.
Oil	4·31	3·37
Albuminoids	58·12	60·44
Phosphate of Lime	16·91	16·80
Salt	2·60	3·21

Feeding Meals.

The one sample of Sharps sent was pure, and answered the description given ; while, as regards the samples of Maize Meal and Dairy Meal, there is nothing specially to note.

Lime.

Attention has been given more generally of late, and very properly so, to the liming of land.

The appended analyses show how Lime will vary, and indicate the desirability of having samples analysed before the purchase is made :—

	A.	B.	C.	D.
Oxide of Iron and Alumina	7·82	·39	2·94	·59
Lime	61·82	89·60	26·91	75·09
Magnesia	·32	·53	17·40	·60
Silica	16·04	·79	2·14	·89
Water, Carbonic Acid, etc.	14·00	8·69	50·61	22·83
	100·00	100·00	100·00	100·00

A was not a good sample, but contained a good deal of Iron and Silica, while the actual amount of Lime was low ; a good Lime should contain about 85 per cent. of Lime (CaO).

B was a good sample, and was also well ground.

C was an inferior and very moist sample containing a quantity of Magnesia. It cost 12s. per ton f.o.r.

D was, doubtless, originally a quite good Lime, but it had become hydrated to a considerable extent, and the price, £2 17s. 8d. per ton, was too much.

Chalk.

	A.	B.
Oxide of Iron and Alumina	1·24	·59
*Lime	50·43	46·39
Magnesia	·45	·12
Silica	6·51	·95
Carbonic Acid, Water, etc.	41·37	51·95
	100·00	100·00
*equal to Carbonate of Lime	90·06	82·84

Both of these were good samples, and if obtainable near at hand, would, no doubt, be used to advantage. In the case of B, I was told that there was a kiln on the spot, and that the demand for lime had determined the owner on restarting the burning of the chalk.

BASIC SLAG.

The appended analyses show the variable quality of this material:—

	A. per cent.	B. per cent.	C. per cent.	D. per cent.
Total Phosphates	18·35	34·87	43·74	28·84
Fineness of Grinding	82·5	72·10	80·3	79·2

A had been guaranteed to contain 26-28 per cent. of phosphates, but was found by my analysis to be considerably below this. It had cost £6 4s. 6d. per ton., and the four tons purchased were returned to the vendor after receipt of my report.

B was of higher quality, but should have been rather better ground.

SUPERPHOSPHATE.

The three samples sent were all good. The analyses were as follows:—

	A. per cent.	B. per cent.	C. per cent.
Soluble Phosphate	31·14	33·75	30·06

SULPHATE OF AMMONIA.

The one sample sent was very dry, and of exceedingly good quality. It contained:—

	per cent.
Moisture	·35
Nitrogen	21·01
Equal to Ammonia	25·54

KAINIT.

The one sample analysed was as follows:—

	per cent.
Moisture	1·09
Potash	13·86
Equal to Sulphate of Potash	25·65

CREOSOTE.

The sample of Creosote sent was of suitable nature, and contained a good proportion of Crude Tar Acids.

SOIL.

Only one sample of Soil was forwarded. This was of very chalky nature, the analysis pointing to the probability that the soil, like many of this character, was in want of Potash.

WATER.

Of the two samples of water sent, one was in connection with a case of pollution. The other was a water from Salisbury, and was a rather hard, but quite good one for drinking purposes.

Bath and West and Southern Counties Society.

BRISTOL MEETING, 1921.

JUDGES.

HORSES.

Shire.—C. W. TINDALL, Wainfleet, Lincolnshire.

Suffolk.—E. H. WILLIAMS, Alderton Hall, Woodbridge, Suffolk.

Percherons.—T. L. WICKHAM BOYNTON, Burton Agnes Hall, East Yorkshire,

Any Agricultural Breed.—C. W. TINDALL, Wainfleet, Lincolnshire.

Hunters.—T. L. WICKHAM BOYNTON, Burton Agnes Hall, East Yorkshire.

Welsh Cobs.—J. R. BACHE, The Cedars, Knighton, Radnorshire.

Other Ponies.—E. P. NORTHEY, Higher Bowden, Okehampton.

Harness and Saddle.—F. VIVIAN GOOCH, Junior Constitutional Club, Piccadilly, London, W.1.

CATTLE.

Devon.—L. H. ALFORD, Horridge, Ashford, Barnstaple.

South Devon.—W. ROWE, Fairfield, Abbotskerswell.

Shorthorn.—J. DEANE WILLIS Bapton Manor, Codford, Wilts.

Dairy Shorthorn.—J. L. SHIRLEY, Silverton, Woughton, Bucks.

Hereford.—A. E. HUGHES. The Laurels, Bargates, Leominster.

Gloucestershire—A. JONES, Bowcott Farm, Wotton-under-Edge.

Red Poll.—R. B. ASTLEY, Compton Beauchamp, Shrivenham.

Aberdeen-Angus.—G. MILL, Estate Office, Claverdon Leys, Warwick.

British Friesian.—STUART HEATON, Sudbourne Hall, Orford, Suffolk.

Jersey Cows and Heifers.—H. PADWICK. The Red House, West Ashling, Chichester.

Jersey Bulls.—C. C. TUDWAY, The Cedars, Wells, Somerset.

Guernsey.—C. RICHARDSON, Lynchmere Farm, Haslemere.

Kerry.—G. TITUS BARHAM, Sudbury Park, Wembley, Middlesex.

Dexter.—G. TITUS BARHAM, Sudbury Park, Wembley, Middlesex.

Butter Test.—A. F. SOMERVILLE, Dinder House, Wells, Somerset;
J. W. ASHBY, 12, Hanover Square, London, W.

Dairy Herds.—D. T. THRING, Estates Bursar, Merton College, Oxford—Classes 151 and 152; and W. NIXON, Offchurch, Leamington—Class 153.

SHEEP.

Shropshire.—J. MINTON, Dryton, Wroxeter, Salop.

Devon Longwoolled.—E. LAWRENCE, Rull Farm, Cullompton, Devon.

South Devon.—F. J. WINTLE, Keynedon Barton, Kingsbridge.

Kent or Romney Marsh.—H. B. AMOS, Ripton, Ashford, Kent.

Southdown.—M. Tupper, Bignor, Pulborough, Sussex.
Hampshire Down—T. A. Edney Hayter, Highbury, Whitchurch, Hants.
Oxford Down.—C. E. J. Hobbs, Little Faringdon, Lechlade.
Dorset Horn.—W. J. Chick, Stratton, Dorchester.
Dorset Down.—J. Spicer, Bovington, Wool.
Exmoor Horn.—D. N. Purchase, Great Hele Barton, South Molton.
Suffolk.—W. Boggis, Carlton Grange, Brinkley, Newmarket.
Ryeland.—D. J. Thomas, Talachddu, Brecon.
Kerry Hill.—T. E. Kinsey, Winsbury, Chirbury, Salop.

GOATS.

T. W. Palmer, 5, Fenchurch Street, London, E.C.3.

PIGS.

Berkshire.—W. V. Judd, Manor Farm, Micheldever, Hants.
Large Black.—H. J. Kingwell, Bow Grange, Totnes, Devon.
Large and Middle White.—Stuart Heaton, Sudbourne Hall, Orford, Suffolk.
Gloucestershire Old Spots.—(Boars): W. Nixon, Offchurch, Leamington Spa; (Sows): H. Bridgman, Downend, near Bristol.
Herds—J. H. White, Bagborough Home Farm, Shepton Mallet.
Wessex Saddleback.—H. C. Knapman, Estate Office, Norman Court, Salisbury.

PRODUCE.

Cider.—Prof. B. T. P. Barker, M.A., National Fruit and Cider Institute, Long Ashton, Bristol.
Cheese.—J. R. Allen, Highfield, Shepton Mallet.
Cream Cheese, Butter and Cream.—Mrs. A. M. Luke, 9, St. James's Place, The Hoe, Plymouth.

COMPETITIONS.

Butter-Making.—Mrs. A. M. Luke, 9, St. James's Place, The Hoe, Plymouth.
Milking.—H. Bridgman, Downend, Bristol.
Shoeing.—W. A. Welch, M.R.C.V.S., Walcot Street, Bath.

POULTRY.

G. Doble, Royal Ashton Hotel, Taunton (Classes 1 to 23, 50 to 53 and 58 to 71); and C. H. House, 152, Stapleton Hall Road, Stroud Green, London, N.4 (Classes 1, 24 to 49 and 54 to 71).

PRIZE AWARDS, 1921.

*** An animal designated in this list as the "reserve number" is entitled, *conditionally*, to succeed to any prize that may become vacant in its class by reason of the animal placed above it by the Judges afterwards failing to qualify.

† Animals where not otherwise stated, may be considered to have been bred by the Exhibitor.

ABBREVIATIONS EXPLAINED :—S., sire ; d., dam ; s. d., sire of dam ; y., year ; m., month ; w., week ; d., day ; R., Reserve ; V.H.C., Very Highly Commended ; H.C., Highly Commended ; C., Commended.

The Prizes in Classes 18, 19, 20, 29, 30, 56, 57, 67, 151, 152, 153 and 232, and £384 towards the other prizes, were contributed by the Bristol Local Committee ; the Prizes in Classes 6, 31, 88, 92, 97, 98, 99, 178, 179, two Special Prizes for Gloucestershire Old Spot Pigs, and £50 towards the other Prizes in the Horse, Cattle, Sheep and Pig Classes by the Gloucestershire Agricultural Society ; and the Special Prizes for residents in Somerset and £25 towards other prizes by the Somerset County Agricultural Association.

HORSES.

SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book).

CLASS 1.—*Shire Mare, in-Foal, or with Foal at foot.* [8 entries.]

I. (**£15.**)—O. WILLIAMS, Crossways, near Cowbridge, Glamorgan, bay, **Torrell's Bohemian Girl** (96026), foaled 1917, bred by J. Carson, King Sutton, Banbury ; s Sandside Sensation (33518), d Norbury Bohemian Girl (75448), s d Dowsby Forest King (27253) ; in-foal.

II. (**£10.**)—W. J. CUMBER, Theale, Berks, bay, **Theale Venus** (90671), foaled 1916 : s Blaisdon Jupiter 2nd (31207), d Normanby Menestrel Queen (71820), s d Birdsall Menestrel (19337) ; with foal by Basildon Clansman.

III. (**£3.**)—L. B. BEAUCHAMP, Norton Hall, near Bath, bay, **Chilcompton Daydream,** foaled 1915, bred by E. H. Buncombe, Langforth, Wellington, Somerset ; s King Cole 7th (26354), d Day Star (70432), s d Calwich Blend (17226) ; with foal by Mardenpeter.

R. & H.C.—F. W. PARSONS & SON, Speckington, Ilchester, bay mare, **Speckington Victor Success,** foaled 1918 ; s Speckington Victor Chief (35213), d Parkfield's Lass (68121), s d Claydon Nobility (25078) ; with foal by Speckington King Cole 8th (35212).

CLASS 2.—*Shire Filly or Gelding, foaled in* 1920. [9 entries.]

I (**£10.**)—H. R. KING, Poles, Ware, Herts, bay filly, **Goldstone Hyacinth,** bred by W. Evison, Penyhryn, St. Martin's, Oswestry ; s Blaisdon Draughtsman (32113), d Pentremorgan Nun (99609), s d Eaton Nunsuch (27301).

II. (**£5.**)—W. J. CUMBER, Theale, Berks, filly, **Theale Misty Morn** (Vol. 13); s Theale Lockinge (35246), d Avon Queen (69478), s d King Cole 7th (26351).

III. (**£3.**)—O. WILLIAMS, Crossways, near Cowbridge, Glamorgan, bay filly, **Fennylady Goalkeeper** (Vol. 42), bred by G. Cotterill, Fenny Compton, Leamington; s Champion's Goalkeeper (30296), d Gleadthorpe Queen (84985), s d Mimm's Champion (26462).

R.—W. H. PALMER, Stoke's Farm, Wokingham, Berks, brown filly, **Stoke's Belle**; s Monk's Green Friar (35891), d Stoke's Brilliant (95777), s d Northlands Royal Tartan (31704).

H.C.—L. C. PAYNE, Pegglesworth, Andoversford, Glos., bay filly, **Cintra Hazel**; s Moulten Swell 3rd, d Gift Hazel, s d Lunedesdale Express.

CLASS 3.—*Shire Filly or Gelding, foaled in* 1919. [9 entries.]

I. (**£10.**)—W. J. CUMBER, Theale, Berks, bay filly, **Theale Rosemary** (Vol. 42), s Theale Lockinge (35246), d Stanton Zetta Queen (76036), s d Stanton Forest King (23725).

II. (**£5.**)—F. W. PARSONS & SONS, Manor Farm, Speckington, Ilchester, bay filly, **Speckington Lady Cole,** bred by G. Moody, Stapleton Cross, Martock; s Speckington King Cole 8th (35212), d Westby Joan (72962), s d Crag Harold (22254).

III. (**£3.**)—S. S. JAMES, New House, Whitson, Newport, Mon., brown filly, **Whitson Lady**; s Boro Draughtsman, d Torrell's Rose, s d Norbury Mene trel.

R.—H. R. KING, Poles, Ware, Herts, brown filly, **Hawton Ashleaf,** bred by J. Robb, Norwell, Newark; s Wyresdale Draughtsman (3448), d Park Flower, s d Ashenden King (31165).

H.C.—L. B. BEAUCHAMP, Norton Hall, near Bath, bay filly, **May Queen,** bred by G. Edwards, Blagdon, Somerset; s Marden Peter (33356), d Redlynch Mayflower (58128), s d Patrick 2nd (19929)—O. WILLIAMS, Crossways, near Cowbridge, Glamorgan, bay filly, **Pendley Golden Melody,** bred by J. G. Williams, Pendley Manor, Tring, Herts; s Babingley Nulli Secundus (26993), d Taseley Lady Redlynch (76186), s d Redlynch Forest King (23626).

CLASS 4.—*Shire Filly or Gelding, foaled in* 1918. [5 entries.]

I. (**£10.**)—O. WILLIAMS, Crossways, near Cowbridge, Glam., brown filly, **Crossway's Violet,** bred by J. H. Ashton, Sutton St. Edmund, Wisbech; s Gallant Commander (33212), d Big Beauty (80409), s d Bearwardrose Hero (21116).

II. (**£5.**)—H. R. KING, Poles, Ware, Herts, bay filly, **Burghfield Glitter** (97312), bred by J. Lousley, Green Farm, Burghfield, Reading; s Theale Menestrel (54:80), d Goldshell (81535), s d Champion's Clansman (29221).

III. (**£3.**)—T. MANSFIELD, Winterbourne Court, Winterbourne, Glos., dark bay mare, **Court Modesty,** bred by W. M. Clothier, Waddon Farm, Lamyat, Evercreech; s Jameson the Conqueror (30565), d Ladymark (81940), s d Brandmark (19401).

(The Prizes in Class 5 were given by the Society of Merchant Venturers, Bristol).

Class 5.—*Shire Brood Mare, with two of her progeny, the property of a bona fide Farmer, whose sole occupation was farming, within a radius of* 50 *miles of Bristol.* [7 entries.]

I. (£25.)—W. J. Cumber, Theale, Berks, bay mare, **Theale Venus** (90671), foaled 1916; s Blaisdon Jupiter 2nd (31207), d Normanby Menestrel Queen (71820), s d Birdsall Menestrel (19337), with foal by Basildon Clansman; stallion, **Theale Lockfast**; s Theale Lockinge (35246), d Theale Venus (90671), s d Blaisdon Jupiter 2nd (31207).

II. (£15.)—F. W. Parsons & Son, Manor Farm, Speckington, Ilchester, bay mare, **Speckington Victor Success**, foaled 1918; s Speckington Victor Chief (35213), d Parkfield's Lass (68121), s d Claydon Nobility (25078), with foal by Speckington King Cole 8th (35212); bay mare, **Parkfield Lass**, foaled 1910, bred by Exors. of E. Holdcroft, Parkfields, Blurton; s Claydon Nobility (25078), d Barlaston Lass (46948), s d Newstead Royal William (18975); and bay filly, **Speckington Nobility**, foaled 1919; s Speckington Coming King (35211), d Parkfield's Lass (68121), s d Claydon Nobility (25078).

III. (£10.)—F. H. Unwin, Longdon Hall, Tewkesbury, grey colt, **Greenhill Forest King**, bred by A. Scott, Greenhill, Sheffield; s Ruler's Forest King, d Greenhill Forest Queen, s d Redlynch Forest King; grey, **Greenhill Forest Queen**, foaled 1910, bred by J. H. Wain, Basford; s Redlynch Forest King, d Hanfield Beauty, s d Patriarch; and grey, **Greenhill Dray Queen**, foaled 1914, bred by Arthur Scott, Greenhill, Sheffield; s Tatton Dray King, d Greenhill Forest King, s d Redlynch Forest King.

Class 6.—*Shire Mare or Filly, shown in one of the above Classes by a Member of the Gloucestershire Agricultural Society.* [7 entries.]

I. (£7.)—W. J. Cumber, Theale, Berks, bay mare, **Theale Venus** (90671), foaled 1916; s Blaisdon Jupiter 2nd (31207), d Normanby Menestrel Queen (71820), s d Birdsall Menestrel (19337); with foal by Basildon Clansman.

II. (£5.)—W. J. Cumber, bay filly, **Theale Rosemary** (Vol. 42); s Theale Lockinge (35246), d Stanton Zetta Queen (76036), s d Stanton Forest King (23725).

Class 7.—*Shire Stallion, foaled before* 1919. [2 entries.]

I. (£15.)—E. R. Debenham, Bladen Estate, Affpiddle, Dorset, bay, **Speckington Forester**, foaled 1918, bred by F. W. Parsons, Speckington, Ilchester; s Marden Peter (33356), d Debenham Daisy (78664), s d Babingley Nulli Secundus (26993).

II (£10.)—Dr. T. C. Wilson, The Brow, Swindon, dark brown, **Day House Menestrel**, foaled 1918, bred by C. Horton, Day House, Coate, Swindon; s Menestrel Boy 4th (31656, Vol. 35), d Day House Josephine (88157, Vol. 39).

Class 8.—*Shire Stallion, foaled in* 1919. [3 entries.]

I (£15)—W. J. Cumber, Theale, Berks, **Theale Lockfast**; s Theale Lockinge (35246), d Theale Venus (90671), s d Blaisdon Jupiter 2nd (31207).

II. (£10.)—H. R. KING, Poles, Ware, Herts, bay, **Theale Justice,** bred by E. H. Buncombe, Longforth, Wellington, Somerset ; s Champion's Chancellor (33095), d Longforth White Heather (78649), s d King Cole 7th (26351).

CLASS 9.—*Shire Colt, foaled in* 1920. [8 entries.]

I. (£15.)—W. H. PALMER, Stoke's Farm, Wokingham, Berks, bay, **Stoke's Secundus** ; s Babingley Nulli Secundus (26993), d Monk's Green Melody (82309), s d Norbury Menestrel (23543).

II. (£10.)—C. WITHERS, Stratton Farm, Clapton, Portishead, bay, **Walpole Hope,** bred by W. J. Cumber, Theale, Berks ; s Theale St. Clair (35248), d Waydale Hope (86862), s d Woodreeve (24772).

III (£3)—O. WILLIAMS, Crossway, near Cowbridge, Glam., bay, **Rowington Security** (Vol. 42), bred by T. Horn, Mousley End, Rowington, Warwick ; s Rowington Recruit (35145), d Stanford's Hill Queen (90502), s d Burdon Forest Premier (25890).

R.—DR. T. C. WILSON, The Brow, Swindon, bay, bred by T. Dibble, Eastrop Farm, Highworth, Wilts ; s Marden Peter (33356), d Shopnoller Rose (86368), s d King Cole 7th (26357).

SPECIAL PRIZE (A).

(Open only to Residents in the County of Somerset for Animals entered in Classes 1 to 9).

Best Shire Brood Mare, in-foal, or with foal at foot.

I. (£10.)—L. B. BEAUCHAMP, Norton Hall, near Bath, bay, **Chilcompton Daydream,** foaled 1915, bred by E. H. Buncombe, Langforth, Wellington Somerset ; s King Cole 7th (26354), d Day Star (70432), s d Calwich Blend 17226) ; with foal by Mardenpeter.

R.—F. W. PARSONS & SON, Speckington, Ilchester, bay mare, **Speckington Victor Success,** foaled 1918 ; s Speckington Victor Chief (35213), d Parkfield's Lass (68121), s d Claydon Nobility (25078) ; with foal by Speckington King Cole 8th (35212).

SPECIAL PRIZE (B).

(Open only to Residents in the County of Somerset for Animals entered in Classes 1 to 9).

Best Shire Filly, foaled in 1919 *or* 1920.

I. (£10.)—F. W. PARSONS & SON, Manor Farm, Speckington, Ilchester, bay filly, **Speckington Lady Cole,** bred by G. Moody, Stapleton Cross, Martock ; s Speckington King Cole 8th (35212), d Westby Joan (72962), s d Crag Harold (22254).

R.—L. B. BEAUCHAMP, Norton Hall, near Bath, bay filly, **May Queen**-bred by G. Edwards, Blagdon, Somerset ; s Marden Peter (33356), d Redlynch Mayflower (58128), s d Patrick 2nd (19929).

SPECIAL PRIZE (*C*).

(Open only to Residents in the County of Somerset for Animals entered in Classes 1 to 9).

Best Shire Colt or Gelding, foaled in 1919 *or* 1920.

I. (**£10.**)—C. WITHERS, Stratton Farm, Clapton, Portishead, bay, **Walpole Hope,** bred by W. J. Cumber, Theale, Berks; s Theale St. Clair (35248), d Waydale Hope (86862), s d Woodreeve (24772).

(*MEDAL D.*)

GIVEN BY THE SHIRE HORSE SOCIETY.

A Gold Medal, or the sum of £10, *for the best Mare or Filly in the Shire Horse Classes, under Conditions* 47, *and to the Breeder of the winner under the Conditions stated, a prize of* £5.

I.—O. WILLIAMS, Crossways, near Cowbridge Glamorgan, bay, **Torrell's Bohemian Girl** (96026), foaled 1917, bred by J. Carson, King Sutton, Banbury; s Sandside Sensation (33518), d Norbury Bohemian Girl (75448), s d Dowsby Forest King (27253); in-foal.

R.—W. J. CUMBER, Theale, Berks, bay, **Theale Venus** (90671), foaled 1916; s Blaisdon Jupiter 2nd (31207), d Normanby Menestrel Queen (71820), s d Birdsall Menestrel (19337); with foal by Basildon Clansman.

SUFFOLK.

(£36 towards the Prizes in Classes 10 to 13 was contributed by the Suffolk Horse Society).

CLASS 10.—*Suffolk Filly, foaled in* 1919. [2 entries.]

I. (**£10.**)—THE MARQUIS OF GRAHAM, Easton Park, Wickham Market, Suffolk, chestnut (star on forehead), **Hawstead Beatrice** (10459), bred by S. Fitzroy, Hawstead Lodge, Bury St. Edmunds; s Sudbourne Peter Pan (4214), d Rendlesham Bloom (8082), s d Rendlesham Goldsmith (3095).

II. (**£5.**)—WEBBINGTON FARMS, LTD., Webbington, Axbridge, Somerset, chestnut, **Webbington Jewel.** bred by H. P. Goodchild, Witnesham, Ipswich; s Morston Gold Guard (4234), d Diamond (8741), s d Ruchmere Viking.

CLASS 11.—*Suffolk Filly, foaled in* 1918. [4 entries.]

I. (**£10.**)—A. T. PRATT, Morston Hall, Trimley, Ipswich, Suffolk, chestnut (white mark down face), **Morston Golden Girl** (9945); s Morston Gold Guard (4234), d Bella (8438), s d Morston Hero (4067).

II. (**£5.**)—THE MARQUIS OF GRAHAM, Easton Park, Wickham Market, Suffolk, whole red chestnut, **Hawstead Flossie** (9928), bred by S. Fitzroy, Hawstead Lodge, Bury St. Edmunds; s Hasketon Prince of Orange (4282), d Hasketon Flo (7076), s d Sproughton Gold Ring (3347).

III. (**£3.**)—THE MARQUIS OF GRAHAM, light chestnut (silver hairs on forehead and body), **Easton Chimes** (9723); s Sudbourne Bellman, d Easton Maid of Honour (6736), s d Cook's Denington Cupbearer (3086).

CLASS 12.—*Suffolk Stallion, foaled in* 1918. [3 entries.]

I. (**£10.**)—A. T. PRATT, Morston Hall, Trimley, Ipswich, Suffolk, chestnut (small star), **Morston Golden Rule,** bred by C. F. Marriner, Thorpe Hall, Hasketon, Suffolk ; s Morston Gold Guard (4234), d Hasketon Susie 6th (8353), s d Darsham Shiek (4139).

II. **£5.**)—F. N. GARRARD, Flint House, Goring Heath, chestnut, **Framlingham Curfew** (4825), bred by W. Woodgate, Debach, near Woodbridge ; s Sudbourne Bellman (4153), d Badingham Pansy (5852), s d Rendlesham Goldsmith (3095).

III. (**£3.**)—F. N. GARRARD, chestnut, **Goring Rufus** (4880) ; s Redwald (3346), d Rendlesham Bellona (6727), s d Everitt's Livington Marquis (3171).

CLASS 13.—*Suffolk Stallion, foaled in* 1919. [4 entries.]

I. (**£10.**)—A. C. SMITH, Sutton Hall, Woodbridge, Suffolk, chestnut, **Shotley Lad** (4902), bred by H. W. Packard, Shotley, Ipswich ; s Sudbourne Beau Brocade (4235), d Sudbourne Lady (5574), s d Rendlesham Goldsmith (3095).

II. (**£5.**)—A. T. PRATT, Morston Hall, Trimley, Ipswich, Suffolk, chestnut (whole colour red), **Morston Gold Chance** (4983) ; s Morston Gold Guard (4234), d Smart (7131), s d Rendlesham Goldsmith (3095).

III. (**£3.**)—A. PRESTON-JONES, Mickleover House, near Derby, chestnut, **Mickleover Goldenrod** ; s Marston Gold Guard (4234), d Blossom (8260).

PERCHERONS.

(£33 towards the prizes in Classes 14 to 17 was contributed by the British Percheron Horse Society).

CLASS 14.—*Percheron Mare, with foal at foot.* [4 entries.]

I. (**£10.**)—SIR H. H. A. HOARE, Bart., Stourhead, Zeals, S.O., Wilts, grey, **Livourne,** foaled 1911, bred by — Casse, St. Maiscent, Petites Binetières, Montmiral Mainers, La Sarthe ; s Houleux (F,74223), d Bleue (F.49492), s d Frier-a-Bras (F.13555) ; with foal by Orlando.

II. (**£5.**)—COL. THYNNE, Hache Stud, Bulstrode, Gerrard's Cross, Bucks, grey, **Jewel,** foaled 1915 ; with foal. .

CLASS 15.—*Percheron Colt or Filly Foal, produce of Mare in Class* 14. [3 entries.]

I. (**£6.**)—SIR H. H. A. HOARE, Bart., Stourhead, Zeals, S.O., Wilts, grey, **Livourne,** foaled 1911, bred by — Casse, St. Maiscent, Petites Binetières, Montmiral Mainers, La Sarthe ; s Houleux (F.74223), d Bleue (F. 49492), s d Frier-a-Bras (F13555) ; with foal by Orlando.

II. (**£4.**)—COL. THYNNE, Hache Stud, Bulstrode, Gerrard's Cross, Bucks, grey, **Jewel,** foaled 1915 ; with foal.

CLASS 16.—*Percheron Filly, foaled in* 1918 *or* 1919. [2 entries.]

I. (**£10.**)—C. P. ACKERS, Huntley Manor, Gloucester, grey, **Smaltine,** foaled 1918, bred by M. Chaboche, La Basse Vallée, L'Orne, France ; s Limon (99810), d Plattée (125865), s d Limon (99810).

II. (£5.)—C. P. Ackers, grey, **Smille,** foaled 1918, bred by M. Chaboche, La Basse Vallée, L'Orne, France; s Limon (99810), d Fernand (59042), s d Fernando (34038).

Class 17.—*Percheron Colt or Filly, foaled in* 1920. [6 entries.]

I. (£10.)—G. M. Gibbs, Gratwicke Hall, Flax Bourton, Somerset, grey filly, **Gratwicke Oison** (B.267); s Ombrieu (B.15), d Oie (B.62), s d Jaddus (F.89198).

II. (£5.)—Col. Thynne, Hache Stud, Bulstrode, Gerrard's Cross, Bucks, black, **Umslopogaas**; s Quapulet, d Pagaie.

III. (£3.)—Lord Stalbridge, Motcombe House, Shaftesbury, grey colt, **Motcombe Pigeon**; s Parapet, d Pigeonette (117), s d Lovis (F.100377).

R.—G. M. Gibbs, black filly, **Gratwicke Pamela** (B.239); s Newport (B.20), d Nellie Blyth (B.148), s d Americain (F.63422).

ANY AGRICULTURAL BREED.

Class 18.—*Mare or Gelding, not under* 4 *years old, suitable for town purposes, the bona fide property of a yeoman or tenant farmer, whose sole occupation was farming and whose farm was situate within* 25 *miles of the Guildhall, Bristol.* [2 entries.]

I. (£10.)—W. R. Withers, Lower Court, Long Ashton, Bristol, bay Shire mare, **Marchioness 5th,** foaled 1916; s Hendre Royal Harold (20562), d Marchioness (64299), s d Stanton Forest King (23725).

Class 19.—*Any Agricultural Breed Filly or Gelding, foaled in* 1919, *the owner residing within* 25 *miles of the Guildhall, Bristol.* [4 entries.]

I. (£10.)—S S. James, New House, Whitson, Newport, Mon , brown Shire filly, **Whitson Lady**; s Boro Draughtsman, d Torrell's Rose, s d Norbury Menestrel.

II. (£5.)—L. B. Beauchamp, Norton Hall, near Bath, bay shire filly, **May Queen,** bred by G. Edwards, Blagdon, Somerset; s Marden Peter (33356), d Redlynch Mayflower (58128), s d Patrick 2nd (19929).

III. (£3.)—W. R. Withers, Lower Court, Long Ashton, Bristol, chestnut Shire filly, **Long Ashton Flower,** bred by W. Cole, Moreton Farm, Compton Martin, Bristol; s King Jameson (31557), d Flower, s d Hornchurch Insurgent (21535).

Class 20.—*Any Agricultural Breed Filly, Colt or Gelding, foaled in* 1920, *the owner residing within* 25 *miles of the Guildhall, Bristol.* [4 entries.]

(*In Classes* 18, 19 *and* 20, *the animals exhibited must have been in the possession of the owner for not less than six months previous to the closing of the entries*).

I. (£10.)—L. B. Beauchamp, Norton Hall, near Bath, black colt, **Delny Victor Chief,** bred by Bourne Bros., Norton St. Philip, near Bath; s Marden Peter (33356), d Langforth White Heather (78649), s d King Cole 7th (26351).

II. (**£5.**)—L. B. Beauchamp, bay shire colt, **Delny Goalkeeper,** bred by Sir B. Greenwell, Bart., Marden Park, Woldingham, Surrey; s Champion's Goalkeeper (30296), d Marden Joan (64303), s d Lockinge Forest King (18867).

III. (**£3.**)—W. G. Davis & Son, Land Farm, Rolston, Hewish, near Bristol, bay colt, **Rolston Hero,** foaled in 1920; s Rhoscollan Forest Chief (35128), d Venture (90792), s d Littleworth Friar (27502).

HUNTERS.

Class 21.—*Hunter Mare, in-Foal, or with Foal at foot.* [5 entries.]

I. (**£15.**)—Warre & Unwin, Longdon Hall, Tewkesbury, chestnut, **Patricia 4th** (H.I.S. 5278), foaled 1915, bred by J. Norbury, Heathside, Knutsford; s Sly Patrick, d Wishful, s d Anklebiter; in-foal.

II. (**£10.**)—S. H. Jenks, Pilsdon Manor Farm, Canonicorum, bay, **Cark Victory** (5643), foaled 1917, bred by G. Dickinson, Cark-in-Cartmel; s Silver Grill.

III. (**£3.**)—Major E. M. Watts, Eastwood Park, Falfield, Glos., bay, **Larch** (5847), foaled 1911, bred by Lieut.-Col. E. C. Meysey Thompson, Spellow Hill, Knaresborough, Yorks; s Birk Gill, d Brittania, s d Prince Vortimar; with foal by Howtown.

R.—Major E. M. Watts, chestnut, **Eva 3rd** (4407), foaled 1912, bred by W. Newton, Barrowby Old Hall, Grantham; s Travelling Lad, d Eve 2nd, s d All Blue; with foal by Ragged Robin.

C.—Major E. M. Watts, bay, **Seaforth Lassie** (5350), foaled 1913; with foal by Ilston.

SPECIAL PRIZE (F).

Best Hunter Brood Mare, in-foal or with foal at foot, the property of a Resident in the County of Somerset—£10.

[No Award]

MEDAL (H).

Given by the Hunters' Improvement and National Light Horse Breeding Society, under Condition 48.

A Gold Medal, or £5 and a Bronze Medal, for the Best Hunter Brood Mare in Class 21, *registered with a number in the Hunter Stud Book, at the time of entry or within a month of the award, not having previously won the above-named Society's Gold Medal as a Brood Mare in* 1921, *and which must have her foal at foot, or produce a living foal in* 1921 *to a thoroughbred horse or Registered Hunter sire. In the second instance a certificate to that effect must be forwarded before the Medal is sent. Only prize winners in the class were eligible for the medal.*

I.—Warre & Unwin, Longdon Hall, Tewkesbury, chestnut, **Patricia 4th** (H.I.S. 5278), foaled 1915, bred by J. Norbury, Heathside, Knutsford; s Sly Patrick, d Wishful, s d Anklebiter; in-foal.

R.—S. H. Jenks, Pilsdon Manor Farm, Canonicorum, bay, **Cark Victory** (5643), foaled 1917, bred by G. Dickinson, Cark-in-Cartmel; s Silver Grill.

CLASS 22.—*Hunter Filly, Colt or Gelding, foaled in* 1920. [6 entries.

I. (**£10.**)—SIR E. D. STERN, Fan Court, Chertsey, Surrey, dark brown gelding, **Rawley**; s General Villa, d Brunette.

II. (**£5.**)—T. H. PEARCE & SON, Parsonage Farm, Long Ashton, chestnut colt, bred by F. Vivash, Emery Farm, Brislington; s King's Prize.

III. (**£3.**)—MAJOR E. M. WATTS, Eastwood Park, Falfield, Glos., bay colt, **Schooner**; s Ilston, d Brig.

R.—MAJOR E. M. WATTS, bay gelding, **Shire Khan**; s Ilston, d Seaforth Lassie (5850).

C.—SIR H. H. A. HOARE, Bart., Stourhead, Zeals, Wilts, grey gelding, **Penselwood,** bred by — Gulliford, Down's Farm, Witham Friary; s King's Prize.

CLASS 23.—*Hunter Filly, Colt or Gelding, foaled in* 1919. [7 entries.]

I. (**£10**)—MISS M. A. BULLOWS, Edgbaston Riding School, Edgbaston, Birmingham, bay gelding, **Stort**; s Stortford (S.B. 145), d Winkie (S.B. 4543), s d Hanover Square.

II. (**£5**)—H. C. BAKER, Oaklands, Almondsbury, Glos., chestnut gelding, **Rufus 2nd**; s John Lambton.

III. (**£3.**)—S. H. JENKS, Pilsdon Manor, Canonicorum, brown gelding, bred by G. Dickinson, Cark-in-Cartmell; s Silver Grill, d Bridget 4th.

R.—H. C. HANDOVER, Swanley, Berkeley, Glos., bay filly, **Meave**; s John Lambton, d Rose (unregistered), s d St. Nicholas.

CLASS 24.—*Hunter Filly or Gelding, foaled in* 1918 [10 entries.]

I. (**£10.**)—S. H. JENKS, Pilsdon Manor, Canonicorum, chestnut mare, **Silver Pheasant,** bred by J. Dickinson, Cark-in-Cartmell; s Silver Grill, d Cark Columbine (5357).

II. (**£5.**)—SIR E. D. STERN, Fan Court, Chertsey, Surrey, bay gelding, **Smuts**; s Dundreary, d Brunette.

III. (**£3.**)—F. H. SILVEY, Breadon, Quernhill Road, Staple Hill, near Bristol, bay mare, **Winkle** (5781), bred by S. Codrington, M.R.C.V.S., Chipping Sodbury, Glos.; s John Lambton, d Sea Shell.

R.—MAJOR E. M. WATTS, Eastwood Park, Falfield, Glos., chestnut filly, **Flannelette** (5681), bred by M. S. Thomson, Spotsmains, Kelso, Roxburghshire; s Hunty Gowk, d Pyjamas, s d Pantomime.

C.—S. H. JENKS, bay mare, **Pilsdon Queen**; s Palmer, d Belles of Shannon.

CLASS 25.—*Hunter Mare or Gelding, foaled in* 1917. [5 entries.]

I. (**£10.**)—G. HOWE, Hunting Stables, Taunton, bay gelding, **John,** foaled 1917.

II. (**£5.**)—J. B. TILL, Mangotsfield, Glos., chestnut gelding, **Nomination** (Supp. 497); s Diragal, d Dauntless, s d Freebooter.

III. (**£3.**)—C. C. STOKES & SONS, Keynsham, Somerset, chestnut gelding, **Cock Robin,** foaled 1917, bred by R. A. Bowring, Rockhill, Keynsham, Somerset; s Beau Lally.

CLASS 26.—*Hunter Mare or Gelding, foaled before* 1918, *to carry under 14 stone.* [17 entries.]

I. (£20.)—MAJOR R. M. S. RICHARDSON, Idover House, Dauntsey, Chippenham, Wilts, brown gelding, **Windsor,** foaled 1913.

II. (£10.)—MRS. R. LAYE, The Warren, Wotton-under-Edge, Glos., bay gelding, **Diplomatist,** foaled 1913, bred by J. Dunkeley, The Elms, Kislingbury, Northants ; s First Consul, s d Ethelbruce.

III. (£3.)—CHATTERTON & ORD, Hunting Stables, Marston Magna, Somerset, grey gelding, **Silver King,** foaled 1913.

R.—MAJOR C. E. TURNER, Old Down, Tockington, near Bristol, bay gelding, **The Curate** ; s The Convert, s d Melon.

H.C.—MISS MUSGRAVE, 35a, Great Cumberland Place, London, bay gelding, **Swagman,** foaled 1913 ; s Agar, d Natasha 2nd.

C.—S. PETCH, Gainsborough House, Milborne Port, Somerset, bay gelding, **Idaho,** foaled 1915 ; s Marzio, d Ida, s d Locksley.

CLASS 27.—*Hunter Mare or Gelding, foaled before* 1918, *to carry* 14 *stone or over.* [12 entries.]

I. (£20.)—SIR E. D. STERN, Fan Court, Chertsey, Surrey, brown gelding, **Botha,** foaled 1915 ; s Dundreary, d Brunette.

II. (£10.)—J. K. STEVENSON, The Chase, Upper Welland, Malvern Wells, bay gelding, **Bay Rhum,** foaled 1914 ; s Barkis.

III. (£3.)—G. HOWE, Hunting Stables, Taunton, grey gelding, **Self Starter,** foaled 1915.

R.—CAPTAIN M. W. MUIR, M.F.H., Postlip Hall, Winchcombe, Glos., chestnut gelding, **Liffeybank,** foaled 1912 ; s Bergomask, s d Gay Reveller.

C.—G. HOWE, chestnut mare, **Sincerity,** foaled 1916 ; s Kilwangate.—W. MORLEY, Broomfield Hall Farm Stables, Sunningdale, Berks, bay gelding, **Silversand,** foaled 1914 ; s Sandstone.

CLASS 28.—*Hunter Mare or Gelding, foaled before* 1918, *that had not won a Prize of* £10 *or over under saddle at any Show held previous to April* 16, 1921. [18 entries.]

I. (£10.)—CHATTERTON & ORD, Hunting Stables, Marston Magna, Somerset, grey gelding, **Silver King,** foaled 1913.

II. (£5.)—MAJOR R. M. S. RICHARDSON, Idover House, Dauntsey, Chippenham, Wilts, bay gelding, **Red Ribbon,** foaled 1914.

III. (£3.)—MAJOR C. E. TURNER, Old Down, Tockington, near Bristol, bay gelding, **The Curate** ; s The Convert, s d Melon.

R.—S. PETCH, Gainsborough House, Milborne Port, Somerset, bay gelding, **Idaho,** foaled 1915 ; s Marzio, d Ida, s d Locksley.

C.—C. C. STOKES & SONS, Keynsham, Somerset, chestnut gelding, **Cock Robin,** foaled 1917, bred by R. A. Bowring, Rockhill, Keynsham, Somerset ; s Beau Lally.

CLASS 29.—*Hunter Mare or Gelding, foaled before* 1917, *to carry* 14 *stone and over, the owner residing within* 25 *miles of the Guildhall, Bristol.* [4 entries.]

I. (**£20.**)—A. JAMES, Totterdown, Bristol, gelding, **Schoolmaster,** foaled 1915.

II. (**£10.**)—MAJOR R. M. S. RICHARDSON, Idover House, Dauntsey, Chippenham, Wilts, bay gelding, **Red Ribbon,** foaled 1914.

CLASS 30.—*Hunter Mare or Gelding, foaled before* 1917, *to carry* 12 *stone and under* 14 *stone, the owner residing within* 25 *miles of the Guildhall, Bristol.* [7 entries.]

I. (**£20.**)—MAJOR R. M. S. RICHARDSON, Idover House, Dauntsey, Chippenham, Wilts, brown gelding, **Windsor,** foaled 1913.

II. (**£10.**)—MRS. R. LAYE, The Warren, Wotton-under-Edge, Glos., bay gelding, **Diplomatist,** foaled 1913, bred by J. Dunkeley, The Elms, Kislingbury, Northants ; s First Consul, s d Ethelbruce.

III. (**£5.**)—MAJOR C. E. TURNER, Old Down, Tockington, near Bristol, bay gelding, **The Curate** ; s The Convict, s d Melon.

R.—MAJOR R. M. S. RICHARDSON, Idover House, Dauntsey, Chippenham, Wilts, brown gelding, **Squirrel,** foaled 1914 ; s Balsamo.

C.—A. JAMES, Totterdown, Bristol, bay gelding, **The Scamp,** foaled 1915, bred by R. J. Julian, Turnpike, Helston ; s Golden Grebe.—T. H. PEARCE AND SON, Parsonage Farm, Long Ashton, brown mare, **Lady Eve,** foaled 1916, bred by — Salisbury, Brislington ; s Lorella.

CLASS 31.—*Hunter Mare or Gelding, five years old or over, shown in any of the above Classes by a member of the Gloucestershire Agricultural Society.* [3 entries.]

I. (**£7.**)—J. K. STEVENSON, The Chase, Upper Welland, Malvern Wells, bay gelding, **Bay Rhum,** foaled 1914 ; s Barkis.

II. (**£5.**)—J. K. STEVENSON, brown gelding, **Mordkin,** foaled 1915.

SPECIAL PRIZE (E.)

Best Hunter not exceeding four years old, the property of a Resident in Somerset.

I. (**£10.**)—G. HOWE, Hunting Stables, Taunton, bay gelding, **John,** foaled 1917.

SPECIAL PRIZE (G).

GIVEN BY THE GLOUCESTERSHIRE AGRICULTURAL SOCIETY.

The Cheltenham Challenge Cup, value £20, *for the best exhibit in Class* 31. *The Cup to be won by the same exhibitor with different animals three years in succession or four years at intervals, before becoming his absolute property. (The Cup to be retained by the winner until May* 10*th*, 1922, *when it must be returned to the Secretary of the Gloucestershire Agricultural Society, security being given for the performance of this condition).*

I.—J. K. STEVENSON, The Chase, Upper Welland, Malvern Wells, bay gelding, **Bay Rhum,** foaled 1914 ; s Barkis.

R.—J. K. STEVENSON, brown gelding, **Mordkin,** foaled 1915.

MEDAL (I).

GIVEN BY THE HUNTERS' IMPROVEMENT AND NATIONAL LIGHT HORSE BREEDING SOCIETY, UNDER CONDITION 49.

A Silver Medal or £1 *(at the option of the winner), for the Best Hunter Mare or Gelding of any age, exhibited by a member of the Hunters' Improvement and National Light Horse Breeding Society, whose subscription to that Society must be paid within a month of the award. Only prize-winners in the Class were eligible for the Medal.*

I.—SIR E. D. STERN, Fan Court, Chertsey, Surrey, brown gelding, **Botha,** foaled 1915 ; s Dundreary, d Brunette.

R.—S. H. JENKS, Pilsdon Manor, Canonicorum, chestnut mare, **Silver Pheasant**, bred by J. Dickinson, Cark-in-Cartmell ; s Silver Grill, d Cark Columbine (5357).

COBS AND PONIES.

(£40 towards the prizes in Classes 32 to 39 were offered through the Welsh Cob and Pony Society).

CLASS 32.—*Welsh Cob Mare, foaled in or before* 1917, *in-foal or with foal at foot First prize,* £5—*second,* £3—*third,* £2.

[NO ENTRY.]

CLASS 33.—*Welsh Cob, Filly, Colt or Gelding, foaled in* 1918 *or* 1919—*First prize,* £5—*second,* £3—*third,* £2.

[NO ENTRY.

CLASS 34.—*Welsh Cob, Filly, Colt or Gelding, foaled in* 1920. *First prize,* £5—*second,* £3—*third,* £2.

[NO ENTRY.]

CLASS 35.—*Welsh Cob Stallion, foaled in or before* 1917. *First prize,* £5—*second,* £3—*third,* £2.

[NO ENTRY.]

WELSH MOUNTAIN PONIES.

CLASS 36.—*Welsh Mountain Pony Brood Mare, foaled in or before* 1917, *not exceeding* 12 *hands, neither docked or hogged, in-foal or with foal at foot, and must produce a foal in* 1921 *before receiving a prize.* [5 entries.]

I. (**£5.**)—MRS. H. D. GREENE, Grove, Craven Arms, Salop, grey, **Grove Lightheart** (5159), foaled 1914; s Ch. Dyoll Starlight 4th, d Bleddfa Tell Tale (943), s d Tyrant (477); with foal by Ch. Shooting Star.

II. (**£3.**)—F. F. MASON, The Faraam, Killay, Glam., grey, **Faraam Silverlight** (3802), foaled 1911, bred by M. Lloyd, Llanwrda, Carm.; s Dyoll Starlight 4th (W.S.B.), d Dyoll Quicksilver; with foal by Hawdgar Matchlight (732).

III. (**£2.**)—W. M. DUGDALE, Llwyn, Llanfyllin, Mont., chestnut, **Llwyn Lyddite** (6085), foaled 1916; s Llwyn Cymro (407), d Lady Lightfoot (2902); with foal by Llwyn Cadet (955).

R.—J. CROSS, Penn Mill Farm, Bourton, Dorset, dark chestnut, **Betty,** foaled 1915; with foal.

CLASS 37.—*Welsh Mountain Pony Filly, Colt or Gelding, foaled in* 1918 *or* 1919, *if foaled in* 1918 *height not to exceed* 12 *hands, and if foaled in* 1919, 11.2 *hands.* [3 entries.]

I. (**£5.**)—MRS. H. D. GREENE, Grove, Craven Arms, Salop, grey colt, **Grove Sprightly** (Vol. xx), foaled 1918; s Ch. Shooting Star (73), d Grove Sprite 2nd (4431), s d Grove Ballistite (200).

II (**£3.**)—W. M. DUGDALE, Llwyn, Llanfyllin, Mont., chestnut colt, **Llwyn Mighty Atom,** foaled 1918; s Llwyn Little Wonder (905), d Llwyn Coralie (5205), s d Llwyn Cymro (407).

III. (**£2.**)—F. F. MASON, The Faraam, Killay, Glam., bay colt, **Hardwick Don** (1064), foaled 1919, bred by The Duchess of Newcastle, Clumber, Worksop; s Grove Elfin (729), d Clumber Janet 3rd (3758).

CLASS 38.—*Welsh Mountain Pony, Filly, Colt or Gelding, foaled in* 1920, *not exceeding* 11 *hands.* [4 entries.]

I. (**£5.**)—MRS. H. D. GREENE, Grove, Craven Arms, Salop, brown colt, **Grove Nightshade,** foaled 1920; s Ch. Shooting Star (73), d Grove Twilight (3017) s d Grove Ballistite (200).

II. (**£3.**)—F. F. MASON, The Faraam, Killay, Glam., grey colt, **Faraam Constellation,** foaled 1920, bred by H. Rowe, Strefford, Craven Arms, Salop; s Shooting Star (73), d Grove Stella (2866), s d Grove Ballistite (200).

III. (**£2.**)—H. WHITLEY, Primley, Paignton, South Devon, blue roan filly, **Primley Moonlight,** foaled 1920; s Llwyn Tyrant (207), d Hawddgar Nixie (4968), s d Hawddgar Brightlight (350).

R.—F. F. MASON, bay colt, **Faraam Bumble Bee,** foaled 1920; s Grove Ballistite (200), d Emlyn Betsy (3803).

CLASS 39.—*Welsh Mountain Pony Stallion, foaled in or before* 1917, *not exceeding* 12 *hands and neither docked or hogged.* [4 entries.]

I. (£5.)—MRS. H. D. GREENE, Grove, Craven Arms, Salop, white, **Shooting Star** (73 W.S.B.), foaled 1901, bred by S. M. Wilmot, The Chalet, Alveston; s Dyoll Starlight 4th, d Alveston Belle (572), s d Cymro.

II. (£3.)—W. M. DUGDALE, Llwyn, Llanfyllin, Mont., grey, **Kilhendre Celtic Silverlight** (953), foaled 1916, bred by Miss Chapman, Kilhendre, Ellesmere; s Shooting Star (73), d Grove Apricot (4421), s d Stretton Torchlight.

III. (£2.)—F. F. MASON, The Faraam, Killay, R.S.O., Glam., grey, **Grove Grey Dawn** (893), foaled 1914, bred by Mrs. H. D. Greene, Grove, Craven Arms, Salop; s Dyoll Starlight 4th, d Grove Greyling (2879), s d Stretton Dynamite (76).

R.—F. F. MASON, grey, **Grove Elfin** (729), foaled 1913, bred by Mrs. H. D. Greene, Grove, Craven Arms, Salop; s Grove Ballistite (200), d Grove Fairy (2531).

SPECIAL PRIZES.

GIVEN BY THE WELSH COB AND PONY SOCIETY.

A Silver Medal and Illustrated Certificate—

(*J*) *For the best Welsh Cob Mare or Filly exhibited in Classes* 32 *to* 34.

[NO AWARD.]

(*K*) *For the best Welsh Cob Stallion exhibited in Classes* 33 *to* 35.

[NO AWARD.]

(*L*) *For the best Welsh Mountain Pony Mare or Filly exhibited in Classes* 36 *to* 38.

I.—F. F. MASON, The Faraam, Killay, Glam., grey, **Faraam Silverlight** (3802), foaled 1911, bred by M. Lloyd, Llanwrda, Carm.; s Dyoll Starlight 4th (W.S.B.), d Dyoll Quicksilver; with foal by Hawdgar Matchlight (732).

R.—W. M. DUGDALE, Llwyn, Llanfyllin, Mont., chestnut, **Llwyn Lyddite** (6085), foaled 1916; s Llwyn Cymro (407), d Lady Lightfoot (2902); with foal by Llwyn Cadet (955).

(*M*) *For the best Welsh Mountain Pony Stallion or Colt exhibited in Classes* 37 *to* 39.

I.—MRS. H. D. GREENE, Grove, Craven Arms, Salop, white, **Shooting Star** (73 W.S.B.), foaled 1901, bred by S. M. Wilmot, The Chalet, Alveston; s Dyoll Starlight 4th, d Alveston Belle (572), s d Cymro.

R.—W. M. DUGDALE, Llwyn, Llanfyllin, Mont., grey, **Kilhendre Celtic Silverlight** (953), foaled 1916, bred by Miss Chapman, Kilhendre, Ellesmere; s Shooting Star (73), d Grove Apricot (4421), s d Stretton Torchlight.

OTHER PONIES.

Class 40.—*Mare, not exceeding* 14.2 *hands, suitable to breed Polo or Riding Ponies, in-Foal, or with Foal at foot.* [1 entry.]

I. (**£8.**)—Miss Calmady-Hamlyn, M.B.E., J.P., Bidlake Vean, Bridestowe, Devon, flea-bitten grey, **Griselda 2nd** (2508 Vol. xiii N.P.S. Book), foaled 1907; with foal by Chandi.

Class 41.—*Filly, Colt or Gelding, foaled in* 1919. [1 entry.]

I. (**£8.**)—The Misses Ransford, Houndstreet, Pensford, near Bristol, bay (three white feet) filly, **Pandora**, foaled 1919; s Flashaway.

Class 42.—*Stallion, not exceeding* 15 *hands, suitable to get Polo or Riding Ponies. First prize, £8—second, £4—third, £2.*

[No Entry.]

MEDALS.

Given by the National Pony Society.

(*N*) *A Silver Medal for the best Polo Pony Brood Mare in the Brood Mare Class, entered or eligible for entry in the National Pony Stud Book.*

I.—Miss Calmady-Hamlyn, M.B.E., J.P., Bidlake Vean, Bridestowe, Devon, flea-bitten grey, **Griselda 2nd** (2508 Vol. xiii N.P.S. Book), foaled 1907; with foal by Chandi.

(*O*) *A Silver Medal for the best Polo Pony Stallion, entered or eligible for entry in the National Pony Stud Book or best Polo Pony Entire Colt, one, two or three years old, entered or eligible for entry in the National Pony Supplement, i.e.,* (*a*) *by an Entered Sire, and out of a Entered or Registered Dam; or* (*b*) *by a Thorough-bred, Arab, or Barb Sire and out of an Entered Dam.*

[No Award.]

(*Note "Registered" signifies entered in the "National Pony Approved Mare Register."*)

These Medals were offered subject to Condition No. 51.

HARNESS AND SADDLE

Class 43.—*Mare or Gelding, under* 15 *hands, driven in harness on the* 1*st day of the Show.* [8 entries.]

I. (**£10.**)—Mrs. Putnam, Faringdon, Exeter, **Park Carnation.**

II. (**£5**)—Mrs. Putnam, **Melbourne Fire.**

III. (£2.)—T. Glencross, The Paddocks, Stoke Gifford, Bristol, chestnut gelding, **King Edward.**

R.—Mrs. Butcher, George and Railway Hotel, Bristol, **White Wings.**

C.—H. Whitley, Primley, Paignton, South Devon, grey gelding, **Primley Jasper.**—A. and C. Snow, Even Swindon Farm, Swindon, bay gelding, **Rodbourne Blighty.**

Class 44.—*Mare or Gelding, any height, for riding purposes, shown in saddle on the* 1*st day of the Show.* [11 entries.]

I. (£10.)—T. D. John, Hollys, Lisvane, Glam., chestnut gelding, **Kildare.**

II. (£5.)—A. James, Totterdown, Bristol, bay, **Bella Donna.**

III. (£2.)—Hon. Mrs. Drury-Lowe, Heathfield House, Bletchington, Oxon., chestnut gelding, **Irish Fern.**

R.—G. Howe, Hunting Stables, Taunton, bay gelding, **Simon the Saint.**

C.—G. Howe, chestnut mare, **Sincerity.**

Class 45.—*Mare or Gelding,* 15 *hands or over, driven in harness* **on** *the* 2*nd day of the Show.* [6 entries.]

I. (£10.)—Mrs. Putnam Farringdon. Exeter **Field Marshal.**

II. (£5.)—T. Glencross, The Paddocks, Stoke Gifford, Bristol, chestnut gelding, **M.P.**

III. (£2.)—A. and C. Snow, Even Swindon Farm, Swindon, chestnut gelding, **Rodbourne Sidar.**

R.—A. E. F. Warner. Penrose, Argyll Road, Gloucester, bay mare, **The Lady Masterpiece.**

Class 46.—*Pony, not exceeding* 13.2 *hands, suitable for, and ridden by, a child not over* 14 *years of age on the* 2*nd day of the Show.* (6 entries.]

(*A Whip was presented to the Boy and Girl riders of the three Prize Winners in this Class*).

I. (£5.)—Miss D. Turner, Old Down, Tockington, mare, **Spindleberry.**

II. (£3.)—F. C. Abel, Spark's Farm, Leigh-on-Mendip, **Stella.**

III. (£1.)—Miss J. Daniell, Middle Mill, Falfield, **Dapple.**

R.—J. S. Potter, Stanford Court, Bringstye, Worcester, **Little Cole.**

Class 47.—*Pacing. Best Mare, Stallion or Gelding, not exceeding* 14.3 *hands, driven in harness on the* 2*nd day of the Show. First Prize,* £10—*second,* £5—*third,* £2. [1 entry.]

[No Award.]

CLASS 48.—*Mare or Gelding, any height, that had not previously won a First Prize at the Royal, Bath and West or Royal Counties Show, driven in harness on the 3rd day of the Show.* [9 entries.]

I. (£10.)—R. BLACK, Osbaldwick, York, **Gondolier.**

II. (£5.)—T GLENCROSS, The Paddocks, Stoke Gifford, chestnut gelding, **King Edward.**

III. (£2.)—A. E. F. WARNER, Penrose, Argyll Road, Gloucester, bay mare, **The Lady Masterpiece.**

R.—MRS. A. BURCHER, George and Railway Hotel, Bristol, **White Wings.**

C.—H. WHITLEY, Primley, Paignton, South Devon, grey gelding, **Primley Jasper.**

CLASS 49.—*Trotting. Best Mare, Stallion or Gelding, not exceeding* 14.3 *hands, for speed, driven in harness on the 3rd day of the Show.* [2 entries.]

I. (£10.)—J. FRANCIS, Market Street, Aberdare, dark bay stallion, **The Blacksmith.**

II. (£5.)—MISS A. H. ROW, chestnut mare, **Falmouth Penrose.**

CLASS 50.—*Hack,* 14 *hands and not over* 15.2, *suitable for and ridden by a lady on the 3rd day of the Show.* [10 entries.]

I. (£10.)—A. JAMES, Totterdown, Bristol, bay, **Bella Donna.**

II. (£5.)—HON. MRS. DRURY-LOWE, Heathfield House, Bletchington, Oxon., chestnut gelding, **Irish Fern.**

III. (£2.)—A. M. WILMOT, 3, Trewartha Park, Weston-super-Mare, brown mare, **Polly Flinders.**

R.—**E.** HULLAND, Coneytrowe, Taunton, bay gelding, **Merry Boy.**

V.H.C.—S. PETCH, Gainsborough House, Milborne Port, bay mare, **Princess.**

H.C.—F. J. GILLAM, Ashley Down, Bristol, bay, **Kaiser.**

CLASS 51.—*Tandems, Mares or Geldings, shown in Harness on the 4th day of the Show.* [3 entries.]

I. (£15.)—H. J. COLEBROOK, South Lodge, Ivor Heath, brown gelding, **The Editor** and **The Tatler.**

CLASS 52—*Pairing, Best Mare, Stallion or Gelding, exceeding* 14.3 *hands, driven in harness on the 4th day of the Show. First prize,* £10; *second,* £5; *third,* £2.

[NO ENTRY.]

CLASS 53.—*Pairs of Mares or Geldings, shown in Harness on the 4th day of the Show.* [3 entries.]

I. (£15.)—H. J. COLEBROOK, South Lodge, Ivor Heath, Bucks, brown gelding, **The Editor** and **The Tatler.**

II. (£10.)—T. GLENCROSS, The Paddocks, Stoke Gifford, Bristol, chestnut geldings, **King Edward** and **M.P.**

CLASS 54.—*Mare or Gelding, not over* 13.2 *hands, driven in harness on the* 5*th day of the Show.* [9 entries.]

I. (£10.)—T. EVANS, Berkeley Villa, Swansea, **Berkeley Fame.**

II. (£5.)—MRS. BUTCHER, George and Railway Hotel, Bristol, **White Wings.**

III. (£2.)—W. T. WATKINS, The Croft, Ystead Mynach, **Hengoed Jupiter.**

R.—E. HISCOCK, Lydeard Park, Swindon, bay gelding, **Lydiard Mascot.**

H.C.—MRS. A C. KING, Braishfield Manor, Romsey, **York Rose.**

C.—MRS. G. M HENEGAN, The Grange, The Reddings, Cheltenham.

CLASS 55—*Trotting. Best Mare, Stallion or Gelding, exceeding* 14.3 *hands, for speed, driven in harness on the* 5*th day of the Show.* [5 entries.]

I. (£10.)—G. M. BERESFORD WEBB South Godstone, Surrey, **Lady Brooke.**

II. (£5.)—H. C. PALMER, 241, Church Road, Redfield, Bristol, **Mick.**

III. (£2.)—L. DAVIS, 90, North Street, Downend, **Pride of the West.**

CLASS 56.—*Light Mare or Gelding, the property of a Tradesman residing within a radius of four miles from the Guildhall, Bristol, used solely by him for trade purposes for a period of not less than three months prior to May* 31*st*, 1921, *exhibited in the Trade Cart and Harness in which it had been worked for the same period, on the* 5*th day of the Show.* [12 entries.]

I. (£10.)—H. J. HICKERY, 107, Barrow Road, Bristol, **Kyburn Kathleen.**

II. (£5.)—BRISTOL BREWERY, GEORGES & CO., LTD., Bristol, **Tommy.**

III. (£2.)—H. CREASE, Stud Farm, Bristol Road, Keynsham. **Taffie.**

R.—L. PERICCINI, Barrow Hill, Shirehampton, grey gelding, **Bob.**

Class 57.—*Cart Mare or Gelding, the property of a Tradesman residing within a radius of four miles from the Guildhall, Bristol, used solely by him for trade purposes for a period of not less than three months prior to May* 31*st*, 1921, *exhibited in the Trade Cart and Harness in which it had been worked for the same period, on the fifth day of the Show.* [15 entries.]

I. (**£10.**)—R. P. Hamblin, Ashton Vale, Bristol, bay gelding, **Prince.**

II. (**£5.**)—C. Wintle, Chesham House, Southville, chestnut.

III. (**£2.**)—F. H. Silvey, Brendon, Overnhill Road, Downend, **Victor.**

R.—Grace Bros., Welsh Back, Bristol, **Lady Haig.**

Class 57a.—*For the best turned out Horse and Harness, the property of the Corporation of Bristol, on the* 5*th day of the Show.* [20 entries.]

I. (**£3.**)—H. Blacker, black gelding, **Jim,** 16 years.

II. (**£2.**)—J. Morgan, brown gelding, **Colonel,** 9 years.

III. (**£1.**)—S. Pring, grey gelding, **Bowler,** 7 years.

IV. (**10s.**)—T. Carter, bay gelding, **Prince,** 9 years.

V. (**10s.**)—J. Pimm, grey gelding, **Sam,** 8 years.

VI. (**10s.**)—E. Weston, black gelding, **Billie,** 8 years.

VII. (**10s.**)—F. Condick, chestnut gelding, **Charlie,** 7 years.

VIII. (**10s.**)—G. Smart, brown gelding, **Charlie,** 7 years.

IX. (**10s.**)—J. Stiddard, bay mare, **Dolly,** 12 years.

X. (**10s.**)—J. Milsom, grey gelding, **Jack,** 7 years.

XI. (**10s.**)—H. Farwell, bay gelding, **Boxer,** 13 years.

MEDAL P.

Given by the Hackney Horse Society.

A Silver Medal for the best Mare or Gelding, exhibited in Single Harness, in Classes 43 *to* 57, *subject to Condition* 59.

I.—Mrs. Butcher, George and Railway Hotel, Bristol, **White Wings.**

JUMPING.

Class 58.—*Mare or Gelding,* 15 *hands and over, jumping over the course in the best form on the* 1*st day of the Show.* [11 entries.]

I. (**£10.**)—T. Glencross, The Paddocks, Stoke Gifford, bay gelding, **Monarch.**

II. (**£5.**)—J. P. Glencross, Battenhall, Worcester, **Shamrock.**

III. (**£2.**)—W. A. Pitt, Imberrow, Worcester, **Nancy.**

CLASS 59.—*Mare or Gelding, under* 15 *hands, jumping over the course in the best form on the* 1*st day of the Show.* [8 entries.]

I. (**£10.**)—MISS M. A. BULLOWS, Edgbaston Riding School, Birmingham, liver chestnut gelding, **If Not.**

II. (**£5.**)—T. GLENCROSS, The Paddocks, Stoke Gifford, chestnut gelding, **Thumbs Up.**

III. (**£2.**)—MISS M. A. BULLOWS, bay gelding, **Ormond Boy.**

CLASS 60.—*Mare or Gelding,* 15.3 *hands and over, jumping over the course in the best form on the 2nd day of the Show.* [13 entries.]

I. (**£10.**)—J. P. GLENCROSS, Battenhall. Worcester, **Shamrock.**

II. (**£5.**)—T. GLENCROSS, The Paddocks, Stoke Gifford, bay gelding, **Monarch.**

III. (**£2.**)—F. FRANKLIN, Park End Road, Gloucester. **Huntsman.**

CLASS 61.—*Mare or Gelding, under* 15.3 *hands, jumping over the course in the best form on the 2nd day of the Show.* [14 entries.]

I. (**£10.**)—T. GLENCROSS, The Paddocks, Stoke Gifford, chestnut gelding, **Thumbs Up.**

II. (**£5.**)—MISS M. A. BULLOWS, Edgbaston Riding School, Birmingham, **Ormond Boy.**

III. (**£2.**)—CAPTAIN LAYE, The Warren, Wootton-under-Edge, **Spider.**

CLASS 62 *Mare or Gelding, jumping highest on the 3rd day of the Show.* [6 entries.]

I. (**£10.**)—T. GLENCROSS, The Paddocks, Stoke Gifford, chestnut Gelding, **Thumbs Up.**

II. (**£5.**)—J. FORD, Southcott Farm, Chapmanslade, Westbury, light bay gelding, **Rocket.**

III. (**£2.**)—W. BEEBY, Melton Mowbray, **Jester.**

CLASS 63.—*Mare or Gelding, any height, jumping over the course in the best form on the 3rd day of the Show.* [19 entries.]

I. (**£10.**)—MISS M. A. BULLOWS, Edgbaston, Birmingham, **Ormond Boy.**

II. (**£5.**)—CAPTAIN R. LAYE, The Warren, Wootton-under-Edge, **Tommy Dodd.**

III. (**£2.**)—J. P. GLENCROSS, Battenhall, Worcester, **Shamrock.**

CLASS 64.—*Mare or Gelding,* 15.3 *hands and over, jumping over the course in the best form on the 4th day of the Show.* [12 entries.]

I. (£10.)—CAPTAIN R. LAYE, The Warren, Wootton-under-Edge, **Tommy Dodd.**

II. (£5.)—W. BEEBY, Melton Mowbray, **Jester.**

III. (£2.)—W. BRICE, Step Farm, Faringdon, **Can if I like.**

CLASS 65.—*Mare or Gelding, under* 15.3 *hands, jumping over the course in the best form on the 4th day of the Show.* [14 entries.]

I. (£10.)—T. SINGER, High House Farm, Corsley.

II. (£5.)—T. GLENCROSS, The Paddocks, Stoke Gifford, chestnut gelding, **Steady Trade.**

III. (£2.)—H. F. BARNES, Trowbridge, bay gelding, **Bendigo.**

CLASS 66.—*Mare or Gelding, jumping highest on the 4th day of the Show.* [5 entries.]

I. (£10.)—T. GLENCROSS, The Paddocks, Stoke Gifford, chestnut gelding, **Thumbs Up.**

II. (£5.)—J. FORD, Southcot Farm, Chapmanslade, light bay gelding, **Rocket.**

III. (£2.)—CAPTAIN R. LAYE, The Warren, Wootton-under-Edge, **Spider.**

CLASS 67.—*Mare or Gelding, the property of a Resident within* 25 *miles of the Guildhall, Bristol, jumping over the course in the best form on the 5th day of the Show.* [14 entries.]

I. (£10.)—CAPTAIN R. LAYE, The Warren, Wootton-under-Edge, **Tommy Dodd.**

II. (£5.)—T. GLENCROSS, The Paddocks, Stoke Gifford, chestnut gelding, **Steady Trade.**

III. (£3.)—J. FORD, Southcot Farm, Chapmanslade, Westbury, **Rocket.**

CLASS 68.—*Mare or Gelding, any height, having won a Prize in Classes* 58 *to* 67, *jumping over the course in the best form on the 5th day of the Show.* [13 entries.]

[In this Class the whole of the Jumps were raised at the discretion of the Stewards.]

Equal I. (£15.)—T. GLENCROSS, The Paddocks, Stoke Gifford, bay gelding, **Monarch.**

Equal I. (£15.)—CAPTAIN R. LAYE, The Warren, Wootton-under-Edge, **Tommy Dodd.**

III. (£5.)—T. GLENCROSS, chestnut gelding, **Thumbs Up.**

CATTLE.

DEVON.

(The First Prize in Class 69 and the Prizes in Class 70 were given by the Devon Cattle Breeders' Society).

CLASS 69.—*Devon Cow in-Milk, calved before* 1918. [3 entries.]

I. (£10.)—C. MORRIS, Lydeard Farm, Somerset, **Highfield Farthing 8th** (29389), born 26th December, 1916; s Highfield General (8105), d Highfield Farthing 5th (26925), s d Capton Bellringer (4911).

II. (£5.)—C. MORRIS, Highfield Hall, St. Alban's, **Highfield Fairmaid 2nd** (29395), born 24th February, 1916; s Holcombe Reminder (7413), d Fairmaid (25464), s d Cronje (5470).

CLASS 70.—*Devon Cow or Heifer, in-Milk, milked in the Ring before judging, under Conditions No.* 61. [5 entries.]

I. (£10.)—J. H. CHICK, Wynford Eagle, Dorchester, Dorset, **Wynford Floss C** (476), born 8th October, 1914; s Wynford Charmer (7301), d Wynford Flower B (201), s d Browda Captain (5440).

II. (£5.)—N. D. LUPTON, Chalmington, Dorchester, Dorset, **Compton Glitter 3rd,** born 13th December, 1914, bred by W. D. Chick, Compton Valence Dorchester; s Compton Doctor (7985), d Compton Glitter 2nd, s d Wyndthorpe Woodrough (6599).

III. (£2.)—J. H. CHICK, **Wynford Pill C** (292), born 23rd July, 1913; s Compton Moses (7015), d Wynford Pink 1st (353) s d Compton Rattler (6309).

CLASS 71.—*Devon Heifer, in-Milk, calved in* 1918. [1 entry.

I. (£10.)—A. POPE, Henstill, Sandford, Crediton, Devon, **Sandford Curly 8th** (31327), born 18th January: s Barum Duke (8355), d Sandford Curly (20888), s d Bickham Boy 3rd (4531).

CLASS 72.—*Devon Heifer, calved in* 1919. [5 entries.]

I. (£10.)—F. J. YENDELL, Upcott, North Molton, North Devon, **Upcott Daisy 14th** (32490), born 1st February; s Pickwell Sir Frederick 2nd (9418), d Daisy 9th (25496), s d John Peel (6797).

II. (£5.)—C. MORRIS, Lydeard Farm, Somerset, **Highfield Brass 5th,** born 9th February; s Highfield Rentpayer (9706), d Highfield Brass 3rd (28564), s d Holcombe Reminder (7413).

III. (£2.)—E. CLATWORTHY, Cutsey, Trull, near Taunton, **Cutsey Browney** (31771), born 29th March; s Overton Goldcoin (9410), d Brown 4th C (293), s d Cutsey Gabriel (7034).

R.—C. MORRIS, Highfield Hall, St. Albans, **Highfield Golden Cup 5th** (32176), born 27th April; s Highfield Gem 3rd (9690), d Highfield Golden Cup 2nd (29401), s d Highfield General (8105).

H.C.—E. C. RAWLE, Bossington Farm, Allerford, Taunton, **Bossington Beauty,** born 12th August; s Cutsey Bobs (8822), d Darkie 3rd.

CLASS 73.—*Devon Heifer, calved in* 1920. [4 entries.]

I. (£10.)—C. MORRIS, Lydeard Farm, Somerset, **Highfield Lottie 3rd,** born 18th February; s Highfield Guage (9689), d Highfield Lottie (27767), s d Longforth Mailbag (7439).

II. (£5.)—J. POPE, Nowers, Wellington, Somerset, **Nowers Rose 11th,** born 21st May; s Stockleigh Prince (9658), d Nowers Rose 7th (29503), s d Stitchport Bungy (7857).

SPECIAL PRIZE.

(Open only to Residents in the County of Somerset).

Best Devon Cow or Heifer, of any age.

I. (£10.)—C. MORRIS, Lydeard Farm, Somerset, **Highfield Farthing 8th** (29389), born 26th December, 1916; s Highfield General (8105), d Highfield Farthing 5th (26925), s d Capton Bellringer (4911).

R.—C. MORRIS, **Highfield Lottie 3rd,** born 18th February; s Highfield Guage (9689), d Highfield Lottie (27767), s d Longforth Mailbag (7439).

CLASS 74.—*Devon Bull, calved in* 1917 *or* 1918. [2 entries.]

I. (£10.)—S. J. COWLING & SONS, Hughslade. Okehampton, **Overton Goldcoin 2nd** (10236), born 9th May, 1918, bred by J. L. Huxtable, Bishop's Tawton; s Capton Butterman (9186), d Overton Myrtle (25912), s d Stockleigh Masterpiece (6548).

CLASS 75.—*Devon Bull, calved in* 1919. [3 entries.]

I. (£10.)—C. L. HANCOCK, The Manor House, Cothelstone, Taunton, **Fiddington Duke** (10542), born 5th April, bred by G. Triggot, Bonson, Fiddington, Bridgwater; s Crazelowman Gold Dust (9625), d Beauty (24050), s d Don Juan (4965).

II. (£5.)—C. MORRIS, Highfield Hall, St. Albans, **Highfield Enterprise** (10594), born 28th February; s Bryanstone Masterpiece (8783), d Mangold 9th (25505), s d Compton Douglas (5733).

CLASS 76.—*Devon Bull, calved in* 1920. [7 entries.]

I. (£10.)—C. MORRIS, Highfield Hall, St. Albans, **Highfield Blue Blood** (Vol. xliv), born 7th March; s Highfield Gem 2nd (9329), d Mangold 9th (25505), s d Compton Douglas (5733).

II. (£5.)—C. MORRIS, Lydeard Farm, Somerset, **Highfield Romance,** born 27th January; s Highfield Guage (9689), d Highfield Alice (30336), s d Highfield General (8105).

III. (£2.)—E. CLATWORTHY, Cutsey, Trull, near Taunton, **Cutsey Peer,** born 4th May; s Gortnell Giant (10555), d Primrose 4th (32015), s d Holcombe Cash Box (8545).

R.—J. H. Chick, Wynford Eagle, Dorchester, Dorset, **Cutsey Rubber,** born 31st March, bred by E. Clatworthy, Cutsey, Trull, Taunton, Somerset; s Overton Goldcoin (9410), d Stratton Rubble (26547), s d Capton Harold (4728).

H.C.—A. Pope, Henstill, Sandford, Crediton, Devon, **Sandford Grand Parade** (Vol. xliv), born 12th July; s Langford Drayman (9740), d Sandford Curly 5th (28664), s d Barum Duke (8355).

SPECIAL PRIZE.

(Open only to Residents in the County of Somerset).

Best Devon Bull, of any age.

I. (£10.)—C. L. Hancock, The Manor House, Cothelstone, Taunton, **Fiddington Duke** (10542), born 5th April, bred by G. Triggot, Bonson, Fiddington, Bridgwater; s Crazelowman Gold Dust (9625), d Beauty (24050), s d Don Juan (4965).

CHAMPION PRIZE.

GIVEN BY THE DEVON CATTLE BREEDERS' SOCIETY.

Best Animal exhibited in Classes 69 to 76.

I. (£10.)—S. J. Cowling & Sons, Hughslade, Okehampton, **Overton Goldcoin 2nd** (10236), born 9th May, 1918, bred by J. L. Huxtable, Bishop's Tawton; s Capton Butterman (9186), d Overton Myrtle (25912), s d Stockleigh Masterpiece (6548).

R.—C. L. Hancock, The Manor House, Cothelstone, Taunton, **Fiddington Duke** (10542), born 5th April, bred by G. Triggot, Bonson, Fiddington, Bridgwater; s Crazelowman Gold Dust (9625), d Beauty (24050), s d Don Juan (4965).

SOUTH DEVON.

(The Prizes in Class 77 were given by the South Devon Herd Book Society).

Class 77.—*South Devon Cow or Heifer, in-Milk or in-Calf, and if in-Calf to calve within three months of the date of the Show.* [7 entries.]

I. (£10.)—D. Camp & Sons, Widland, Modbury, South Devon, **Buttercup 5th** (11777), born 27th Sept., 1912, bred by T. W. Luscombe, Great Englebourne, Totnes; s Rew Rentpayer (3548), d Buttercup 6th (7886), s d Yam Yam (2052).

II. (£5.)—R. W. Chaffe, Worswell Barton, Revelstoke, South Devon, **Worswell Profit,** born 24th July, 1916; s Pamflete Dairyman (4509), d Worswell Primrose Girl (11383).

III. (£2.)—B. Luscombe, Bowden, Yealmpton, Devon, **Bowden Fidget 2nd** (16942), born 20th October, 1916; s Coarswell Yellow Boy (4014), d Fidget (9261).

R.—R. W. Chaffe, **Worswell Phyllis,** born 29th November, 1914; s Pamflete Dairyman (4509), d Worswell Primrose Girl (11383).

CLASS 78.—*South Devon Cow or Heifer, in-Milk, calved in* 1918. [3 entries.]

I. (**£10.**)—COL. THE RIGHT HON. F. B. MILDMAY, M.P., Flete, Ivybridge, **Lilian's Favourite** (20112), born 14th September; s Warrior (6299), d Lilian (10164), s d Henry 8th (3179).

II. (**£5.**)—J. S. WROTH & SONS, Coombe, Aveton Gifford, **Snowball** (20891), born 8th February; s Widland Perfection (5217), d Sylvia 3rd (14877), s d Silver Royal (2771).

CLASS 79.—*South Devon Heifer, calved in* 1919. [7 entries.]

I. (**£10.**)—COL. THE RIGHT HON. F. B. MILDMAY, M.P., Flete, Ivybridge, **Highland's Wallflower** (21803), born 18th June, bred by Mrs. J. Bayly, Highlands, Ivybridge; s Lilian's Champion (6016), d Bring Good (17057), s d Worswell Her (5224).

II. (**£5.**)—A. SOPER & SONS, Gerston, Totnes, **Orange Girl**, born 12th February; s Duke (6504), d Lucy 7th (14061).

III. (**£2.**)—R. SKINNER, Stretchford, Buckfastleigh, **Hilda** (22172), born 2nd September; s Coleridge Monarch (6472), d Maggie (18905).

CLASS 80.—*South Devon Heifer, calved in* 1920. [5 entries.]

I. (**£10.**)—R. SKINNER, Stretchford, Buckfastleigh, **Karlick,** born 1st May; s Coleridge Monarch (6472), d Karlick Stretcher 2nd (15420).

II. (**£5.**)—W. SMERDON, Luson, Yealmpton, **Luson Countess,** born 2nd March: s Luson Perfection (7208), d Vanity (15710), s d Worswell Hero (5224).

III. (**£2.**)—J. S. WROTH & SONS, Coombe, Aveton Gifford, South Devon, **Ruby,** born 12th May, bred by — Richman, Cumey, Aveton Gifford; s Sargent (7341), d Daisy (14387).

CLASS 81.—*South Devon Bull, calved in* 1917 *or* 1918. [4 entries.]

I. (**£10.**)—J. M. WROTH, Coombe, Holbeton, Plymouth, **Mothecombe Milkman** (7245), born 29th January, 1917; s Brownstone Laddie (4774), d Kitty (11346), s d Merafield Paymaster (3491).

II. (**£5.**)—R. W. CHAFFE, Worswell Barton, Revelstoke, near Plymouth, **Worswell Gladiator** (7500), born 26th March, 1917; s Frobisher (5423), d Gladys (5408), s d Juryman.

III. (**£2.**)—H. SPURRIER, Stype Grange, Hungerford, Berks, **Bow Well Bred** (7594), born 23rd March, 1918, bred by — Harris, Well, Stoke Gabriel; s Tidwell Champion (6229), d Pretty Face 5th (10002), s d Golden Fancy (2894).

CLASS 82.—*South Devon Bull, calved in* 1919. [6 entries.]

I. (**£10.**)—G. BANBURY, Stanton Barton, Marldon, Paignton, **Granby** (8499), born 7th January, bred by P. Luce, Court Barton, Lamerton, near Tavistock; s Nero (7250), d Primrose 2nd (15459), s d Court Good Sort (4833).

II. (**£5.**)—COL. THE RIGHT HON. F. B. MILDMAY, M.P., Flete, Ivybridge, **Lily's Champion** (8589), born 13th January; s Warrior (6299), d Lily 7th (15591), s d Bickham Beauty (4280).

III. (**£2.**)—R. SKINNER, Stretchford, Buckfastleigh, **Tinnell Masher** (8788), born 23rd February, bred by S. Every, Tinnell Hall, Cornwall; s Lavender's Boy 2nd (6001), d Rosebud 2nd (13242).

CLASS 83.—*South Devon Bull, calved in* 1920. [5 entries.]

I. (**£10.**)—COL. THE RIGHT HON. F. B. MILDMAY, M.P., Flete, Ivybridge, **Flete Champion,** born 14th February; s Random (7315), d Lily 8th (18524), s d Lilian's Champion (6016).

II. (**£5.**)—J. H. ISMAY, Iwerne Minster House, Blandford, Dorset, **Lixton Councillor 12th,** born 23rd February, bred by S. S. Horton, Lixton, Loddiswell; s Councillor 12th, d Countess 3rd.

III. (**£2.**)—J. S. WROTH & SONS, Coombe, Aveton Gifford, **Combe Hero,** born 4th January; s Sentinell (7344), d Matilda 9th (18264).

SPECIAL PRIZE.

GIVEN BY CHARLES A. HANSON, ESQ., FOWEY HALL, CORNWALL, ALDERMAN OF THE CITY OF LONDON.

A Challenge Cup for the Best Cow in-Milk, in the South Devon Classes, to be won three times in succession or four times altogether, before becoming the property of the winner.

I.—D. CAMP & SONS, Widland, Modbury, South Devon, **Buttercup 5th** (11777), born 27th September, 1912, bred by T. W. Luscombe, Great Englebourne, Totnes; s Rew Rentpayer (3548), d Buttercup 5th (7886), s d Yam Yam (2052).

R.—R. W. CHAFFE, Worswell Barton, Revelstoke, South Devon **Worswell Profit,** born 24th July, 1916; s Pamflete Dairyman (4509), d Worswell Primrose Girl (11383).

SHORTHORN.

CLASS 84.—*Shorthorn Cow, in-Milk, calved before* 1918. [4 entries.]

I. (**£10.**)—H.R.H. THE DUKE OF CORNWALL, K.G., Marsh Farm, Landulph, Hatt, Cornwall, roan, **Aldie Floss,** born 10th March, 1914, bred by Capt. J. MacGilivray, Calrossie, Invernesshire; s King's Champion (116104), d Flossy Jean, s d Diamond Reward.

II. (**£5.**)—S. F. EDGE, Gallops Homestead, Ditchling, Sussex, red roan, **Fairlawne Missie** (Vol. lxii, p. 705), born 26th March, 1915, bred by W. M. Cazalet, Fairlawne, Tonbridge, Kent; s Hawthorn Champion (99098), d Missie 6th (Vol. lvi, p. 1158), s d Montrave Excellence (96142).

III. (**£2.**)—MRS. C. B. ROBINSON, Amberley Court, Monmouth, roan, **Moonflower,** born 15th December, 1917; s British Dreadnought (129923), d Marguerite, s d Tongswood Faith (107298).

CLASS 85.—*Shorthorn Heifer, in-Milk, calved in* 1918. [2 entries.]

I. (£10.)—L. V. GARLAND, Greenbank, Hayle, Cornwall, roan, **Hayle Beauty Sleep 4th** (Vol. lxv, p. 867), born 20th November, bred by W. J. Hosken, Pulsack, Hayle, Cornwall; s Clipper Comet (135764), d Beauty Sleep, s d Golden Cloud 2nd (108751).

II. (£5.)—G. L. BEVAN, Froxfield, Hungerford, Wilts, roan, **Lothian Nonpareil Countess,** born 9th March, bred by the Earl of Rosebery, K.G., K.T., Dalmeny House, Edinburgh; s Lex of Cluny (109170), d Gartly Nonpareil Countess (Vol. lx, p. 935), s d County General (111407).

CLASS 86.—*Shorthorn Heifer, calved in* 1919. [10 entries.]

I. (£10.)—THE HON. MRS. BRUCE WARD, Godinton, Ashford, Kent, roan, **Bilsington Alexandrina 5th,** born 29th January, bred by Exors. of the late R. J. Balston, Bilsington Priory, Ashford, Kent; s Bilsington Vanguard (129670), d Bilsington Alexandrina, s d Daylight (108349).

II. (£5.)—THE HON. MRS. BRUCE WARD, white, **Bilsington Rosebud 11th,** born 12th January, bred by Exors. of the late R. J. Balston, Bilsington Priory, Ashford, Kent; s Dewlap's Royal Sovereign (125170) d Bilsington Rosebud 7th, s d Bilsington Archer (119025).

III. (£2.)—H.R.H. THE PRINCE OF WALES, K.G., Home Farm, Stoke Climsland, Cornwall, roan, **Climsland Augusta 4th,** born 16th April; s Butterfly Knight (130029), d Golden Augusta, s d Gold Mint (95352).

R.—C. E. GUNTHER, Tongswood, Hawkhurst, Kent, red, **Tongswood Helena 4th,** born 25th February, s Knight Lavender (121046), d Tongswood Helena, s d Lord Augustus (109216).

H.C.- R. CORNELIUS, Lutwyche Hall, Much Wenlock, Salop, roan, **Lutwyche Belle 2nd** (C.N.S.53A), born 28th January; s Hindley Bridegroom (131487), d Eastham Belle, s d Village Beau (87631).—MAJOR J. A. MORRISON, D.S.O., Basildon Park,. Goring, Reading, Berks, roan, **Basildon Rosewood Queen,** born 16th October; s Collynie Clipper King (135816), d Rosewood 89th (Vol. lx, p. 954), s d Morton of Cluny.

CLASS 87.- *Shorthorn Heifer, calved in* 1920. [15 entries.]

I. (£10.) –COL F. RHODES, Brockhampton, Andoversford, Glos., roan, **Catehay Queen Augusta,** born 1st January; s Moonlight (126984), d Sherborne Augusta, s d Edgcote Promotion (111682).

II. (£5.)—R. CORNELIUS, Lutwyche Hall, Much Wenlock, Salop, roan, **Lutwyche Charity 3rd** (C.N.S.B.12), born 24th May; s Cluny Mint master (147996), d Charity 20th, s d Newton Crystal (92658).

III. (£2.) - H.R.H. THE DUKE OF CORNWALL, K.G., Marsh Farm, Landulph, Hatt, Cornwall, dark roan, born 3rd March, bred by R. Cornelius, Lutwyche Hall, Much Wenlock, Salop; s Scotch Prestige (151963), d Secret Maid, s d Royal Sovereign.

R.—H.R.H. THE PRINCE OF WALES, K.G., Home Farm, Stoke Climsland, roan, **Queen Marion,** born 2nd March; s Edgcote Count (136364), d Adbolton Mario's Queen, s d King Christian of Denmark (86316).

H.C.—L. V. Garland, Greenbank, Hayle, Cornwall, roan, **Towan Gwynne,** born 26th May; s Christian King (147900), d Hayle Gwynne 12th, s d Clipper Comet (135764).—C. E. Gunther, Tongswood, Hawkhurst, Kent, roan, **Tongswood Dorothy,** born 8th January; s Tongswood Bassoon, d Bright Dorothy, s d Clipper Star.

C.—S. F. Edge, Gallops Homestead, Ditchling, Sussex, red roan, **Vahan Bessie 2nd,** born 21st March; s Prince of the Manor (132834), d Sweet Bessie (Vol. lvii, p. 954), s d Montrave Talisman (109445).

Class 88.—*Shorthorn Cow or Heifer, exhibited in any of the above Classes by a Member of the Gloucestershire Agricultural Society.* [5 entries.]

I. (£7.)—Col. F. Rhodes, Brockhampton, Andoversford, Glos., roan, **Catehay Queen Augusta,** born 1st January; s Moonlight (126[illegible]84), d Sherborne Augusta, s d Edgcote Promotion (111682).

II. (£5.)—R. Cornelius, Lutwyche Hall, Much Wenlock, Salop, roan, **Lutwyche Charity 3rd** (C.N.S.B.12), born 24th May; s Cluny Mintmaster (147996), d Charity 20th, s d Newton Crystal (92658).

R.—R. Cornelius, roan, **Lutwyche Belle 2nd** (C.N.S.53A), born 28th January; s Hindley Bridegroom (131487); d Eastham Belle, s d Village Beau (87631).

Class 89—*Shorthorn Bull, calved in* 1917 *or* 1918. [7 entries.]

I. (£10.) H.R.H. The Prince of Wales, K.G., Home Farm, Stoke Climsland, Cornwall, roan, **Christian King** (147900), born 19th January, 1918; s Butterfly Knight (130029), d Adbolton Rosy Queen, s d King Christian of Denmark (86316).

II. (£5.)—H. Miller, Church Farm, Great Sutton, near Birkenhead, roan, **Steward,** born 11th June, 1918, bred by T. Cormode, Ballawhane, Isle of Man; s Wigton Ruby (134346), d Mona 6th, s d Baron Shapely (107800).

III. (£2.)—R. Stratton, The Duffryn, Newport, Mon., roan, **Greenhorn** (142746), born 30th August, 1917; s Scandal (133434), d Maiden's Blush, s d Renown (93084).

R.—S. H. Jenks, Pilsdon Manor Farm, Whitchurch, Canonicorum, Charisworth, Dorset, roan, **Moresby Warrant Officer** (150673), born 1st May, 1918, bred by Mrs. Burnyeat; s Edgcote White Lion (130843), d Moresby Broadhooks Louisa, s d Morning Star (109463).

H.C.—B. R. Broughton, Manor Farm, North Perrott, Crewkerne, Somerset, roan, **Huxham Dean** (149497, Vol. lxv), born 2nd March, 1918, bred by S. Day, Jun., Huxham, Shepton Mallet; s Signet Prince (122910), d Huxham Charmer, s d Royal Pluto (96938).

Class 90.—*Shorthorn Bull, calved in* 1919. [14 entries.]

I. (£10.)—Misses A. F. and M. K. T. Scott, Nether Swell Manor, Stow-on-the-Wold, roan, **Diamond Champion** (155320), born 14th April, bred by the late W. M. Scott, Nether Swell Manor; s Windsor Lad (113735), d Diamond Actress (Vol. lvii, p. 1150), s d Diamond Star (91479).

II. (**£5.**)—SIR J. BELL, Bellfield, Willerby, Hull, roan, **Clapton Landlord** (Vol. lxvi), born 28th January, bred by B. Wood, Clapton, Northants; s Anderson's Landmark (118532), d Louisa 63rd (Vol. lxii, p. 1191), s d Bride's Fortune (111137).

III. (**£2.**)—HON. MRS. BRUCE WARD, Godinton, Ashford, Kent, red, **Bilsington Resolute** (154033), born 13th January, bred by Exors. of R. J. Balston, Bilsington Priory, Ashford, Kent; s Dewlap Royal Sovereign (125170), d Kora 114th, s d Edgcote Falcon (111674).

R.—C. E. GUNTHER, Tongswood, Hawkhurst, Kent, white, **Tongswood Bequest,** born 17th March; s Knight Lavender, d Tongswood Bessie 3rd, s d Knight Lavender.

H.C.—SIR J. BELL, red roan, **Hindley Nestor** (Vol. lxvi), born 7th April, bred by J. Pumphrey, Stocksfield, Newcastle-on-Tyne; s Doune Rex (142058), d Hindley Nonpareil 4th (Vol. lxii, p. 1037), d Augusta's Diamond 2nd (118650). —LORD BLEDISLOE, K.B.E., Lydney Park, Lydney, Glos., red, **Lydney Archer,** born 26th March; s Royal Archer (139016), d Greta (Vol. lxi, p. 715), s d Sittyton Style (110212).

CLASS 91.—*Shorthorn Bull, calved in* 1920. [18 entries.]

I. (**£10.**)—HON. MRS. BRUCE WARD, Godinton, Ashford, Kent, roan, **Godinton Grand Duke** (Vol. lxvii), born 25th January; s Dewlap's Royal Sovereign (125170), d Bilsington Orphan 2nd, s d Bilsington Favourite (107898).

II. (**£5.**)—H.R.H. THE PRINCE OF WALES, K.G., Home Farm, Stoke Climsland, Cornwall, white, **King of the Fairies,** born 21st April; s Sherborne King Christian, d Sherborne Fairy 4th, s d President of the Mint (109670).

III. (**£2.**)—G. A. WILLS, Langford Court Farm, near Bristol, red, **Rickford Marquis,** born 1st June; s Collynie Royal Regent (148043), d Eliza Lotus (Vol. lxvii), s d Marquis of Millhills.

R.—G. A. WILLS, dark roan, **Rickford Orangeman,** born 6th May; s Collynie Royal Regent (148043), d Orange Blossom 17th (Vol. lxv, p. 648), s d Collynie Favourite (135818).

H.C.—G. L. BEVAN, Froxfield, Hungerford, Wilts, red, **Golden Coronet,** born 16th January, bred by G. B. Shields, Dolphingstone, Tranent, East Lothian; s Shenley Colonel (145395), d Castanet (Vol. lxiii, p. 1245), s d Bapton Fairy Prince (124120).—S. F. EDGE, Gallops Homestead, Ditchling, Sussex, roan, **Vahan Regal,** born 6th May; s Adbolton King Tulip (129026), d Vahan Victress 3rd (Vol. lxiv, p. 877), s d Prince of the Manor (132834).

CLASS 92.—*Shorthorn Bull, calved in* 1919, *exhibited in Class* 90 *by a member of the Gloucestershire Agricultural Society.* [1 entry.]

I. (**£7.**)—LORD BLEDISLOE, K.B.E., Lydney Park, Lydney, Glos., red, **Lydney Archer,** born 26th March; s Royal Archer (139016), d Greta (Vol. lxi, p. 715), s d Sittyton Style (110212).

CHAMPION PRIZE.

GIVEN BY THE PRESIDENT (LORD BLEDISLOE).

A Challenge Cup, value £20, *for the best Bull in Classes* 89 *to* 92.

I.—H.R.H. THE PRINCE OF WALES, K.G., Home Farm, Stoke Climsland, Cornwall, roan, **Christian King** (147900), born 19th January, 1918; s Butterfly Knight (130029), d Adbolton Rosy Queen, s d King Christian of Denmark (86316).

R.—MISSES A. F. AND M. K. T. SCOTT, Nether Swell Manor, Stow-on-the-Wold, roan, **Diamond Champion** (155320), born 14th April, bred by the late W. M. Scott, Nether Swell Manor; s Windsor Lad (113735), d Diamond Actress (Vol. lvii, p. 1150), s d Diamond Star (91479).

CHAMPION PRIZE.

GIVEN BY THE SHORTHORN SOCIETY.

Best Bull in Classes 89 *to* 92, *entered in, or eligible for entry in Coates's Herd Book, with Silver Medal to the Breeder.*

I. (**£10.**)—H.R.H. THE PRINCE OF WALES, K.G., Home Farm, Stoke Climsland, Cornwall, roan, **Christian King** (147900), born 19th January, 1918; s Butterfly Knight (130029), d Adbolton Rosy Queen, s d King Christian of Denmark (86316).

R.—MISSES A. F. AND M. K. T. SCOTT, Nether Swell Manor, Stow-on-the-Wold, roan, **Diamond Champion** (155320), born 14th April, bred by the late W. M. Scott, Nether Swell Manor; s Windsor Lad (113735), d Diamond Actress (Vol. lvii. p. 1150), s d Diamond Star (91479).

DAIRY SHORTHORN.

(The First Prizes in Classes 93 and 94 (and a Silver Medal to the Breeder of the Winners) were given by the Shorthorn Society in conjunction with the Dairy Shorthorn Association, and the First Prize in Class 95 by the Dairy Shorthorn Association).

CLASS 93.—*Pedigree Dairy Shorthorn Cow, in-Milk, calved in or before* 1917, *eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society or Association in* 1920, *milked in the Ring before judging, under Conditions* 61. [12 entries.]

I. (**£10.**)—T. KING, Lower Barnes, Wotton-under-Edge, Glos., roan, **Bridesmaid 8th,** born 26th September, 1915; s Woolmer's Thistle (128969), d Bridesmaid 5th, s d Aldsworth Pride (110732).

II. (**£5.**)—H. T. WILLIAMS, Warren Hall, Broughton, Chester, red, **Maisie 4th,** born 10th December, 1914, bred by A. Adamson, Keswick; s Daisy's Pride (111481), d Maisie, s d Oakfield Pioneer (89456).

R.—F. W. MORLEY, Biddestone Manor, Chippenham, Wilts, light roan, ***Cockerham Purity** (Vol. lxi, p. 933), born 16th February, 1914, bred by G. B. Nelson & Sons, Cockerham Hall, Garstang, Lancs.; s Spency Beau (117836), d Purity, s d Beauty's Heir (94260).

CLASS 94.—*Pedigree Dairy Shorthorn Cow, in-Milk, calved in or after* 1918, *eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society or Association in* 1920, *milked in the Ring before judging, under Conditions* 61. [6 entries.]

I. (**£10.**)—F. W. MORLEY, Biddestone Manor, Chippenham, Wilts, red and little white, **Loobagh Fragrance** (Vol. lxv, p. 806), born 24th September, 1918, bred by Sir G. Greenall, Bart., Mount Coote, Kilmallock, Co. Limerick; s Pud ington Beau 3rd (132908), d Newbrough Fragrance 2nd, s d Oxford Champion (116863).

II. (**£5.**)—SIR J. ANDERSON, BART., The Priory, Harrold, Beds, red, **Marnhull Janette** (Vol. lxv, p. 898), born 10th August, 1918, bred by S. B. Kennard, The Lodge, Marnhull, Dorset: s Cardiace (124632), d Abbotswood Janette, s d Bapton Juror (97944).

CLASS 95.—*Pedigree Shorthorn Bull, calved in* 1920, *entered or pedigree accepted for entry in Coates's Herd Book, subject to Conditions No.* 62. [7 entries.]

I. (**£10.**)—MRS. C. B. ROBINSON, Amberley Court, Monmouth, red and little white, **Amberley Joyful**, born 8th May; s Loobagh Record 3rd (143644), d Sweet Melody, s d Darlington Viceroy 2nd (119808).

II. (**£5.**)—F. W. MORLEY, Biddestone Manor, Chippenham, Wilts, roan, **Foxhill Bright Idea** (Vol. lxvii), born 22nd April, bred by Capt. Hon. E. A. Fitzroy, M.P., Fox Hill, West Haddon, Rugby; s Afterthought (146582), d Dainty Princess 8th, s d Craigwillie Victor (114879).

R.—J. H. RENNIE, Tregarn, Langstone, Newport, Mon., roan, **Gwent Warrior**, born 14th January; s Carleton Warrior (135598), d Teazow Duchesse 5th, s d Mainspring (109310).

V.H.C.—J. A. ATTWATER, Dry Leaze, Cirencester, **King Cole**, born 31st January; s Carleton Warrior (135598), d Brockley Queen (Vol. lxiii, p. 759), s d Winford Thorndale Duke (113736).

H.C.—W. BUTLER, Gatcombe Farm, Flax Bourton, Bristol, roan, **Warren Rambler**, born 8th March, bred by H. T. Williams, Warren Hall, Broughton, Chester; s Leeming Friar (1375 2), d Rose 7th (Vol. lx, p. 739), s d Town End Duke (113558).

(The Prizes in Class 96 were given by Mr. E. Ezra, of Lock, Partridge Green, Sussex).

CLASS 96.—*Pedigree Dairy Shorthorn Heifer, calved in* 1920, *eligible for and entered in Coates's Herd Book or pedigree sent for such entry previous to the Show.* [14 entries.]

I. (**£10.**)—F. W. MORLEY, Biddestone Manor, Chippenham, Wilts, roan, **Biddestone Oxford Lady** (Vol. lxvii), born 8th March; s Southernwood Red King (145612), d Salmon's Oxford Duchess, s d Salmon's Crown Prince (110074).

II. (**£5.**)—T. AND S. BRAITHWAITE, Fieldgrove, Bitton, Glos., light roan, **Fieldgrove Bianca,** born 18th April; s Fonthill Admiral, d Royal Polly, s d Proud Prospector.

III. (**£2.**)—PATRINGTON FARM SETTLEMENTS (CAPT. J. K. HILL), Patrington East Yorks, red and white, **Crown Cherry,** born 22nd February; s Moresby Rear Admiral (150671), d Cherry Tint (Vol. lxi, p. 655), s d Waverley Honour (113690).

R.—J. F. BROUGHTON, Yeabridge, South Petherton, roan, **Yeabridge Dolly,** born 20th March; s Standeford Dollar 34th, d Standeford Dolly 21st (Vol. lxii, p. 655), s d Marshman 5th (121458).

H.C.—E. EZRA, Lock, Partridge Green, Sussex, red and little white, **Lock Frosty,** born 19th May; s Loobagh Waterloo 3rd, d Frosty 26th, s d Trickster 4th.—PATRINGTON FARM SETTLEMENTS (CAPT. J. K. HILL), roan, **Crown Snowstorm,** born 29th March; s Kelmscott Acrobat 11th (137260), d Snowstorm 5th (Vol. lxi, p. 993), s d Moss Trooper (116676).

C.—T. AND S. BRAITHWAITE, red and little white, **Fieldgrove Sabrina,** born 19th March; s Rainford Sundial, d Lady Sabrina 3rd, s d Clodhopper.—SIR W. G. WATSON, BART., Sulhamstead, Reading, red roan (light), **Sulhamstead Cicely,** born 25th May; s Heathenden Darlington King (137030), d Hoole Eliza (Vol. lxi, p. 1016), s d Knolton Lord Morris (109104).

CLASS 97.—*Dairy Shorthorn Cow, in-Milk, exhibited in Class* 93 *by a member of the Gloucestershire Agricultural Society. First prize, £7—second, £5.*

[NO ENTRY.]

CLASS 98.—*Dairy Shorthorn Heifer, in-Milk, calved in* 1918, *exhibited in Class* 94 *by a member of the Gloucestershire Agricultural Society.* [1 entry.]

I. (**£7.**)—T. AND S. BRAITHWAITE, Field grove, Bitton, Glos., roan, **Telluria Mabel,** born 1st March, 1918, bred by J. W. Dawson, Heggle Foot, Wigton, Cumberland; s John Peel, d Haltcliffe Telluria A 3rd, s d Monkhill Mac.

CLASS 99.—*Dairy Shorthorn Bull, exhibited in Class* 95 *by a member of the Gloucestershire Agricultural Society.* [1 entry.]

I. (**£7.**)—J. A. ATTWATER, Dry Leaze, Circencester, **King Cole,** born 31st January; s Carleton Warrior (135598), d Brockley Queen (Vol. lxiii, p. 759), s d Winford Thorndale Duke (113736).

SPECIAL PRIZE.

Best Pure Bred Registered Dairy Shorthorn Cow or Heifer, the property of a resident in the County of Somerset.

I. (**£10.**)—**J. F. BROUGHTON, Yeabridge, South Petherton, roan, Yeabridge Dolly, born 20th March; s Standeford Dollar 34th, d Standeford Dolly 21st (Vol. lxii, p. 655), s d Marshman 5th (121458).**

R.—J. F. BROUGHTON, red and little white, **Moonshine,** born 2nd October; s Vale Boy (Vol. lxiv), d Manor Sunset (Vol. lxiii, p. 895), s d Pansy Prince 2nd (127242).

SPECIAL PRIZE.

Best Pure Bred Registered Dairy Shorthorn Bull, the property of a Resident in the County of Somerset.

I. (£10.)—W. BUTLER, Gatcombe Farm, Flax Bourton, Bristol, roan, **Warren Rambler,** born 8th March, bred by H. T. Williams, Warren Hall, Broughton, Chester; s Leeming Friar (137522), d Rose 7th (Vol. lx, p. 739), s d Town End Duke (113558).

SPECIAL PRIZE.

GIVEN BY THE GLOUCESTERSHIRE AGRICULTURAL SOCIETY.

The "Cirencester" Challenge Cup, value £50, for the best Animal eligible for entry in Coates's Herd Book, exhibited in Classes 84 to 99 by a member of the Gloucestershire Agricultural Society, to be won three times in succession or four times at intervals with different Animals before becoming the absolute property of the winner.

I.—COL. F. RHODES, Brockhampton, Andoversford, Glos., roan, **Catchay Queen Augusta,** born 1st January; s Moonlight (126984), d Sherborne Augusta, s d Edgcote Promotion (111682).

R.—R. CORNELIUS, Lutwyche Hall, Much Wenlock, Salop, roan, **Lutwyche Charity 3rd** (C.N.S.B.12), born 24th May; s Cluny Mintmaster (147996), d Charity 20th, s d Newton Crystal (92658).

SPECIAL PRIZE.

OFFERED BY THE GLOUCESTERSHIRE AGRICULTURAL SOCIETY.

The "Radclyffe" Challenge Cup for the best Bull eligible for entry in Coates's Herd Book, in Classes 89 to 92 and 95, exhibited by a tenant farmer who is a member of the Gloucestershire Agricultural Society, to be won three times by the same exhibitor with different animals before becoming his absolute property.

[NO AWARD.]

HEREFORD.

(The Prizes in Class 107 and the Champion Prizes were given by the Hereford Herd Book Society).

CLASS 100.—*Hereford Cow, in-milk, calved before* 1918. [6 entries.]

I. (£10.)—C. H. TINSLEY, Twyford, Pembridge R.S.O., Herefordshire, **Ruby 2nd,** born 26th May, 1912, bred by E. M. Hopton; s Kinsham, d Ruby, s d Whittern Standard.

II. (£5.)—CAPTAIN R. T. HINCKES, Mansel Court, Hereford, **Dame Brilliancy**, born 7th May, 1915; s Starlight (28754), d Bertha (Vol. xlv, p. 628), s d Eaton Pearl (26830).

III. (£2.)—R. W. HALL & SON, Bidney, Leominster, Herefordshire, **Rouge Alice** (Vol. l, p. 568), born 17th February, 1915; s Shelsley Primer (28705), d Rouge Lucy (Vol. xliv, p. 838), s d Rougemont (20296).

R.—W. H DEPPER, Dean Park, Tenbury, Wells, **Guilder Rose 2nd**, born 18th February, 1916; s Lord Clive (31695), d Guilder Rose, s d Mariner (28468).

CLASS 101.—*Hereford Heifer, in-Milk, calved in* 1918. [3 entries.]

I. (£10.)—D. P. BARNETT, Walterston, Llancarfan, near Cowbridge, **Dolesome**, born 20th March, bred by Viscount Rhondda, Llanwern; s Sir Sam (33131), d Dorothy 4th (Vol. xlvii, p. 415), s d Brampton Dictator (28071).

II. (£5.) C. R. ENGLISH, Evesbatch Court, Bishops Frome, Herefordshire, **Rarity**, born 24th January, bred by J. Rowlands, Evesbatch Court, Bishops Frome; s Shelsley (26480), d Red Rose (Vol. xlviii, p. 990), s d Red Gold (27812).

III. (£2.)—W. J. PITT, The Albynes, Bridgnorth, Salop, **Cedar**, born 13th March; s New on Glance (35350), d Albynes Cypress (Vol. l, p. 803), s d Cameron (28125).

CLASS 102.—*Hereford Heifer, calved in* 1919. [4 entries.]

I. (£10.)—D. P. BARNETT, Walterston, Llancarfan, near Cowbridge, **Walterston Boadicia**, born 18th January; s Sir Sam, d Boadicia, s d Candidate (24465).

II. (£5.)—F. F. MASON, The Faraam, Killay, Glamorgan, **Faraam Dorcas**, born 4th May; s Mansel Resentful (35288), d Faraam Dutiful (Vol. xlvii, p. 759), s d Marcus (27003).

CLASS 103.—*Hereford Heifer, calved in* 1920. [11 entries.]

I. (£10.)—HARRIS & CHURCH, Armadale, Hereford, **Cotmore Lily**, born 6th February, bred by R. W. Hall & Son, Bidney, Leominster, Herefordshire; s King of the Lilies (35146), d Lady Tumbler 2nd (Vol. xlv, p. 576), s d Lord Grey (26977).

II. (£5.)—C. R. ENGLISH, Evesbatch Court, Bishops Frome, Herefordshire, **Rose Curly**, born 7th January; s Vandal (31144), d Evesbatch Curly 10th (Vol. l, p. 888), s d Carbine (28132).

III. (£2.)—O. WILLIAMS, Crossways, Cowbridge, Glamorgan, **Crossways Merry Lass**, born 22nd February; s Bodenham Gallant (34638), d Merry Lass (Vol. xliii, p. 339), s d Lemon Punch (28411).

R.—MAJOR N. S. WILSON, Norton Grange, Malmesbury, **Highland Maid**, born 30th March; s Bromide (38693), d Highland Mary, s d Highland Prince (25437).

H.C.—J. WALKER, Knightwick Manor, Worcester, **Knightwick Plover**, born 27th January; s Peacemaker (35397), d Pigeon (Vol. l, p. 962), s d Snowdon (31059).

C.—F. F. MASON, The Faraam, Killay, **Faraam Gavotte**, born 23rd January; s Mansel Resentful (35288), d Gay Lass (Vol. xlv, p. 733), s d Pyon Gauntlett (24910).

CHAMPION PRIZE.

Best registered Hereford Cow or Heifer in Classes 100 *to* 103.

I. (£10.)—C. H. TINSLEY, Twyford, Pembridge R.S.O., Herefordshire, **Ruby 2nd,** born 26th May, 1912, bred by E. M. Hopton ; s Kinsham, d Ruby, s d Whittern Standard.

R.—D. P. BARNETT, W lterston, Llancarfan, near Cowbridge, **Dolesome,** born 20th March, bred by Viscount Rhondda, Llanwern ; s Sir Sam (33131), d Dorothy 4th (Vol. xlvii, p. 415), s d Brampton Dictator (28071).

CLASS 104.—*Hereford Bull, calved in* 1917 *or* 1918. [3 entries.]

I. (£10.)—P. E. BRADSTOCK, Free Town, Tarrington, Hereford, **Koh-i-Nor,** born 12th January, 1918 ; s Goodenough (33710), d Princess (Vol. xlix, p. 386), s d Prince Charming (29982).

II. (£5.)—EARL OF COVENTRY, Croome Court, Worcester, **Banker** (35932), born 14th January, 1918 ; s Maidenstown (33929), d Balloon (vol. xlv p 420), s d Glittering Gold (24628).

CLASS 105.—*Hereford Bull, calved in* 1919. [6 entries.]

I. (£10.)—Sir J R G. COTTERELL, BART , Garnons, Hereford **Burgundy,** born 16th March ; s Saladin (31957), d Barmaid 5th, s d Royal Ringer (2[illegible]8).

II. (£5.)—J. K. HYSLOP, Ivington, Leominster, **Ivington Ranger** (37015), born 15th January ; s Newton Division (32840), d Ripe 4th, s d Rougemont (20296).

III (£2.)—Captain R. T. Hinckes Mansel Court, Hereford **Mansel Banner Guard** (37350), born 9th January ; s **Turgot** (34412) d G[illegible] V[illegible]l. [illegible] p. 5[illegible]7) s d Rougemont (20296).

R. EARL OF COVENTRY, Croome Court, Worcester, **Gallant** (36756), born 1st April : s Wigmore 9th (34500), d Gadfly (Vol. xlvi, p. 420), s d Golden Way (26175).

H.C.—S. PYMAN, Pigeon House, Ross, **Silver Shred** (38049), born 2nd March, bred by Newman Bros., Lower Weckton, Leominster ; s Patchwork (34099), d Silverdale (Vol. l, p. 761), s d Baron Gipsey (30277).

CLASS 106.—*Hereford Bull, calved in January or February,* 1920. [12 entries.]

I. (£10.)—C. H. TINSLEY, Twyford, Pembridge R.S.O., Herefordshire, **Twyford Fairy Boy,** born 16th January ; s Bounds Investment, d Fairy Girl 3rd, s d Sir Albert.

II. (£5.)—LORD CAWLEY, Berrington Hall, Leominster, **Coniston,** born 4th January ; s Bounds Imperialist (36077), d Couey (Vol. xlv, p. 782), s d Weston Speculator (29453).

III. (£2.)—P. E. BRADSTOCK, Free Town, Tarrington, Hereford, **Free Town Model,** born 24th January ; s Goodenough (33710), d Sonia (Vol. xlvi, p. 357), s d Castle Cross (27428).

R.—Captain R. T. Hinckes, Mansel Court, Hereford, **Mansel Laststar,** born 24th January; s Starlight (28754), d Polly 15th, s d Eaton Sovereign (26832).

H.C.—S. Pyman, Pigeon House, Ross, **Walsh Wonderful,** born 16th January, bred by J. W. Walker, The Court House, Shelsley Walsh; s Forest King (32517), d Tagalie (Vol. xlvii, p. 1041), s d Evesbatch Commander (28262).

C.—J. Walker, Knightwick Manor, Worcester, **Aldersend Prefect,** born 9th February, bred by W. Griffiths, Aldersend, Tarrington: s Aldersend Wilton (34542), d Pretoria (Vol. xlix, p. 527), s d Comrade (32389).

Class 107.—*Hereford Bull, calved on or after March 1st,* 1920. [11 entries.]

I. (**£10.**)—O. Williams, Crossways, Cowbridge, Glamorgan, **Crossway Chef** (38910), born 9th March, 1920; s Bodenham Gallant (34638), d Holly Cook (Vol. xlviii, p. 717), s d Hollybush David (31587).

II. (**£5.**)—Major N. Wilson, Norton Grange, Malmesbury, **Plumstone,** born 24th March, 1920; s Worcester (33279), d Plum, s d Sailor Prince (26465).

III. (**£2.**)—D. P. Barnett, Walterston, Llancarfan, near Cowbridge, **Broadberry,** born 8th March, 1920; s Broadseal (36171), d Hackberry, s d Tramp (28785).

R.—S. Pyman, Pigeon House, Ross-on-Wye, **Gatsford Tumbler** (G.J.a23), born 7th March, 1920; s Diamond King (33604), d Lady Tumbler (Vol. xlvi, p. 622), s d Tumbler (17588).

H.C.—Captain R. T. Hinckes, Mansel Court, Hereford, **Mansel Angelfinder,** born 19th April, 1920; s Lulsley Puffin, d Cronkhill Angel (Vol. xlvi, p. 554), s d Crossbar (27469).

C.—Captain R. T. Hinckes, **Mansel Cantfinder,** born 22nd March, 1920; s Lulsley Puffin, d Cheerful Girl 2nd s d Starlight (28754).

CHAMPION PRIZE.

Best registered Bull in Classes 104 *to* 107.

I. (**£10.**)—P. E. Bradstock, Free Town, Tarrington, Hereford, **Koh-i-Nor,** born 12th January, 1918; s Goodenough (33710), d Princess (Vol. xlix, p. 386), s d Prince Charming (29982).

R.—Sir J. R. G. Cotterell, Bart., Garnons, Hereford, **Burgundy,** born 16th March: s Saladin (31957), d Barmaid 5th, s d Royal Ringer (26458)

GLOUCESTERSHIRE

(£20 of the Prizes in Classes 108 and 111 were given by the Gloucestershire Cattle Society).

Class 108.—*Gloucestershire Cow or Heifer, in-Milk, calved before* 1919. [2 entries.]

I. (**£7.**)—**Lieut.-Col. H. C. Elwes, D.S.O., M.V.O., Colesborne Park, Cheltenham, black and white, Shelsley Bluebell (88), born 1913, bred by Sir L. Darell, Bart. (the late), Fretherne Court, Stonehouse.**

CLASS 109.—*Gloucestershire Heifer, calved in* 1919 *or* 1920. [2 entries.]

I. (£7.)—DUKE OF BEAUFORT, Badminton, dark red and white, **Buttercup,** born 4th March, 1919 ; s Jock, d Handsome.

II. (£3.)—LIEUT.-COL. H. C. ELWES, D.S.O., M.V.O., Colesborne Park, Cheltenham, black and white, **Colesborne Primula 2nd** (57), born 1919, bred by Sir L. Darell, Bart. (the late), Fretherne Court, Stonehouse ; d Primula 1st (51).

CLASS 110.—*Gloucestershire Bull, calved before December* 31, 1919. [1 entry.]

I. (£7.)—T. J. WEBB, Hardwicke Farm, near Gloucester, **Councillor,** 3 years old.

CLASS 111.—*Gloucestershire Bull, calved after January* 1*st,* 1919. [1 entry.]

I. (£7.)—LIEUT.-COL. H. C. ELWES, D.S.O., M.V.O., Colesborne Park Cheltenham, black and white, **Colesborne Prince** (135), born November, 1919 ; s Darell (50), d Primula (51).

RED POLL.

(£34 towards the Prizes in Classes 112 to 115 were given by the Red Poll Cattle Society).

CLASS 112.—*Red Poll Cow or Heifer, in-Milk, calved before* 1919. [12 entries.]

I. (£10.)—J. P. ARKWRIGHT, Hatton House, Warwick, **Hatton Gravely** (25655), born 9th November, 1914 ; s Lucifer (10446), d Hatton Grateful (22596), s d Capton Klado (9542)

II. (£5.)—G. D. SMITH, Strensham Court, Worcester, **Strensham Agra,** born 20th March, 1917 ; s Ashlyn's Count, d Honingham Aggie, s d Andracles.

III. (£2.)—J. P. ARKWRIGHT, **Hatton Fable** (24035), born 10th March, 1912 ; s Acton Hussar (9881), d Hatton Fairy (21188), s d Honingham Ajax (9099).

R.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading Berks, **Kettleburgh Rosie 2nd C,** born 17th January, 1912, bred by H. G. Walne, Kettleburgh Hall, Wickham Market, Suffolk ; s Free Trader (10029), d Kettleburgh Rosie 2nd (19870), s d Standard Bearer (9331).

CLASS 113.—*Red Poll Heifer, calved in* 1919 *or* 1920. [11 entries.]

I. (£10.)—THE MARQUIS OF GRAHAM, Easton Park, Wickham Market, Suffolk, **Easton Armine,** born 5th January, 1920 ; s Sudbourne Albion (11064), d Red Fawn (25310), s d Red David (10069).

II. (£5.)—G. R. P. LLEWELLYN, Combend, Elkstone, near Cheltenham, Glos., **Plumstead Poupee** (Vol. xxxvii), born 28th February, 1919, bred by Major D. G. Astley, Little Plumstead Hall, Norwich ; s The Hussar (11233), d Plumstead Powder Puff (25301), s d Battleaxe (10142).

III. (**£2.**)—G. R. P. Llewellyn, **Shornham Roseleaf 20th** (Vol. xxxvii), born 20th July, 1919, bred by P. Palmer, Thornham, Suffolk ; s Acton Peachstone (10944), d Roseleaf H 13th (26241), s d Thornham Hero (9754).

R.—G. D. Smith, Strensham Court, Worcester, **Strensham Limpet,** born 24th March, 1919 ; s Alaram, d Strensham Sea Shell, s d Strensham Purple Emperor.

Class 114.—*Red Poll Bull, calved in or before* 1919. [9 entries.]

I. (**£10.**)—J. G. Dugdale, The Abbey, Cirencester, **Necton Gloucester** (11423), born 13th February, 1918, bred by R. H. Mason, Necton Hall, Swaffham ; s Shrewsbury (10489), d Godiva (22573), s d Turk (10115).

II. (**£5.**)—A. C. Smith, Sutton Hall, Woodbridge, Suffolk, **Ashmoor Sir Richard** (Vol. xxxviii, R.P.H.B.), born 17th May, 1919 ; s Ashmoor Piave (11090), d Ashmoor Joan (23386), s d Dax (9567).

III. (**£2.**)—T. Brown & Son, Marham Hall, Downham, Norfolk ; **Marham Primus** (11414), born 16th August, 1918 ; s Kerrison Surprise (10880), d Prima P.1. (20487), s d Fitzgerald (8956).

R.—The Marquis of Graham, Easton Park, Wickham Market, Suffolk, **Easton Aristocrat,** born 11th April, 1919 ; s Sudbourne Albion (11064), d Lady Vanity (25575), s d Lysander (10610).

Class 115.—*Red Poll Bull, calved in* 1920. [6 entries.]

I. (**£10.**)—J. P. Arkwright, Hatton House, Warwick, **Hatton Fabulist,** born 14th January ; s Sudbourne Major (11076), d Hatton Fable (24035), s d Acton Hussar (9881).

II. (**£5.**)—Lieut.-Col. Sir M. R. Burrell, Bart., C.B.E., Knepp Castle, Sussex, **Knepp King of the Meadows,** born 20th March ; s Knepp Crown, d Letton Meadow Dell, s d Letton Omega 2nd Davyson.

III. (**£2.**)—J. P. Arkwright, Hatton Gallant, born 6th April ; s Sudbourne Major (11076), d Hatton Glove (24600), s d Acton Hussar (9881).

ABERDEEN-ANGUS.

(The First Prize in Class 116 was given by the English Aberdeen-Angus Cattle Association).

Class 116.—*Aberdeen-Angus Cow or Heifer, in-Milk, calved before 1st December,* 1918. [3 entries.]

I. (**£10.**)—Major J. A. Morrison, D.S.O., Basildon Park, Goring, Reading, Berks, **Kind Jilt of Tarsets,** born 20th March, 1916, bred by A. J. Forbes, Tarsets, Tipperty, Aberdeenshire ; s Kindness Again 2nd (38148), d Cullen Jilt (53171), s d Earl of Mar of Cullen (30320).

II. (**£5.**)—E. A. Wigan, Conholt Park, Andover, **Lady Rose of Conholt** (61430), born 11th December, 1916 ; s Earl Ebon of Ballindalloch (35751), d Tuberose of Standen (43477), s d Elector of Benton (21814).

III. (**£2.**)—E. A. Wigan, **Tuberose of Conholt** (55475), born 16th December, 1913 ; s Baron Breslau (30146), d Tuberose of Standen (43477), s d Elector of Benton (21814).

CLASS 117.—*Aberdeen-Angus Heifer, calved on or after* 1*st December,* 1918. [4 entries.]

I. (£10.)—LIEUT.-COL. M. G. E. BELL, Bourne Park, Canterbury, **Pearlette 2nd of Bourne** (64051), born 1st December, 1918 ; s Darwin 5th of Claverdon (39190), d Pearlette 2nd of Glenfarclas (52535), s d Raider of Ballindalloch (31197).

II. (£5.)—J. H. BRIDGES, Langshott, Horley, Surrey, **Pride of Armistice** (64109), born 18th January, 1919 ; s Gardafui of Ballindalloch (31967), d Quicksilver Pride (47885), s d Prince of Ake (24932).

III. (£2.)—LORD PIRRIE, K.P., Witley Park, Godalming, Surrey, **Isabel 52nd** (65583), born 25th December, 1918 ; s Royal Prince of Brucklay (36931), d Isabel 46th (58969), s d Earl Benin 2nd (31617).

CLASS 118.—*Aberdeen-Angus Heifer, calved on or after* 1*st December,* 1919. [8 entries.]

I. (£10.)—J. J. CRIDLAN, Maisemore Park, Gloucester, **Estella 3rd of Maisemore,** born 3rd December, 1919 ; s Idyll of Maisemore (36219), d Estelle of Maisemore (50414), s d Everwise (24436).

II. (£5.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks. **Eveline of Basildon,** born 25th January, 1920 ; s Idan of Basildon, d Echo of Basildon, s d Prominent Prince (35118).

III. (£2.)—W. R. BOARD, Great Frampton, Llantwit Major, Cardiff, **Plasma 3rd of Frampton,** born 9th May, 1920 ; s General Picton (45985), d Plasma of Frampton (61760), s d Peasant of Glenfarclas (40166).

R.—W. R. BOARD, **Missie of Frampton,** born 2nd June, 1920 ; s General Picton (45985), d Misty Morn (61759), s d Peasant of Glenfarclas (40166).

V.H.C.—E. A. WIGAN, Conholt Park, Andover, **Clematis of Conholt** (Vol. xlv), born 28th February, 1920 ; s Ether of Bleaton (39535), d Cowslip of Standen (40217), s d Elector of Benton (21814).

H.C.—LORD PIRRIE, K.P., Witley Park, Godalming, Surrey, **Witley Kate** (67962), born 1st January, 1920 ; d Kathleen of Witley 2nd (60949), s d Royal Prince of Brucklay (36931)

C.—H. C. VENNING, Willett, Bicknoller, Taunton, **Valentine of Willett** (68354), born 12th February, 1920 ; s Proud Prince of Bywell (44528), d Venetia of Bywell (51809), s d Juan Eric (30733).

CLASS 119.—*Aberdeen-Angus Bull, calved before December* 1*st,* 1919. [4 entries.]

I. (£10.)—J. J. CRIDLAN, Maisemore Park, Gloucester, **Eric 2nd of Maisemore,** born 11th December, 1917 ; s Elegant of Tubberdaly (37578), d Erica of Maisemore (52160), s d Brave Briton of Maisemore (30218).

II. (£5.)—J. H. BRIDGES, Langshott, Horley, Surrey, **Earl of Surrey** (43238), born 1st December, 1917 ; s Gatti (39698), d Ellaline of Langshott (50254), s d Eland of Ballindalloch.

III. (**£2.**)—C. T. SCOTT, Buckland Manor, Broadway, **Etrurian of Buckland** (45802), born 1st December, 1918; s Etrurian of Bleaton (41498), d Elasticity of Bywell (51787), s d Vellum of Bywell (32650).

R.—W. R. BOARD, Great Frampton, Llantwit Major, Cardiff, **General Picton** (45985), born 4th July, 1918; s Moore (34877), d Pride of Preston 47th (44960), s d Endurance of Preston (26793).

CLASS 120.—*Aberdeen-Angus Bull, calved on or after December 1st,* 1919. [4 entries.]

I. (**£10.**)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading, Berks, **Baron Eros of Bleaton** (47225), born 12th January, 1920, bred by Marshall and Mitchell; s Baron Beauford (35480), d Rose Mary Erica (49660), s d Edward Carr (25496).

II. (**£5.**)—J. J. CRIDLAN, Maisemore Park, Gloucester, **Vulcan of Blueberry** (49420), born 25th March, 1920, bred by A. P. Cross, Lamport Hall, Northamptonshire; s Myrmidon of the Burn (38324), d Violet of Preston 13th (55804), s d Eloro (30415).

III. (**£2.**)—H. C. VENNING, Willett, Bicknoller, Taunton, **Princely of Willett** (49026), born 22nd February, 1920: s Proud Prince of Bywell (44528), d Bywell Pride (59558), s d Meteor of Apethorpe (38262).

R.—LIEUT.-COL. M. G. E. BELL, Bourne Park, Canterbury, **Sunster of Bourne** (49307), born 24th December, 1919; s Provost of Bourne (40411), d Stumpie of Bourne (53763), s d Plutarch of Aldbar (32336).

CHAMPION PRIZES.

GIVEN BY THE ABERDEEN-ANGUS CATTLE SOCIETY.

A Silver Medal for the Best Animal in Classes 116 *to* 120.

I.—J. J. CRIDLAN, Maisemore Park, Gloucester, **Eric 2nd of Maisemore,** born 11th December, 1917; s Elegant of Tubberdaly (37578), d Erica of Maisemore (52160), s d Brave Briton of Maisemore (30218).

R.—J. J. CRIDLAN, **Estella 3rd of Maisemore,** born 3rd December, 1919; s Idyll of Maisemore (36219), d Estelle of Maisemore (50414), s d Everwise (24436).

A Silver Medal for the Best Animal of opposite sex, in Classes 116 *to* 120.

I.—J. J. CRIDLAN, Maisemore Park, Gloucester, **Estella 3rd of Maisemore,** born 3rd December, 1919; s Idyll of Maisemore (36219), d Estelle of Maisemore (50414), s d Everwise (24436).

R.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Kind Jilt of Tarsets,** born 20th March, 1916, bred by A. J. Forbes, Tarsets, Tipperty, Aberdeenshire: s Kindness Again 2nd (38148), d Cullen Jilt (53171), s d Earl of Mar of Cullen (30320).

GIVEN BY THE ARGENTINE ABERDEEN-ANGUS SOCIETY.

A Silver Medal for the Best Animal in Classes 116 *to* 120.

I.—J. J. CRIDLAN, Maisemore Park, Gloucester, **Eric 2nd of Maisemore,** born 11th December, 1917; s Elegant of Tubberdaly (37578), d Erica of Maisemore (52160), s d Brave Briton of Maisemore (36218).

R.—J. J. CRIDLAN, **Estella 3rd of Maisemore,** born 3rd December, 1919; s Idyll of Maisemore (36219), d Estelle of Maisemore (50414), s d Everwise (24436).

BRITISH FRIESIAN.

(£25 towards the Prizes in Classes 121 to 124 were given by the British Friesian Cattle Society).

CLASS 121.—*British Friesian Cow or Heifer, any age, in-Milk.* [18 entries.]

I. (£10.)—THE HACHE HERD (Col. Thynne and Sir G. Ramsden, Bart.), Muntham Home Farm, Findon, Worthing, **Wigginton Saakje 2nd** (p. 1, 5019), born 6th November, 1915, bred by - Schnier, Pulborough, Sussex; s Wigginton (imported) Johan (4637), d Wigginton (imported) Saakje 10th (19768) s d De Hoop (5406).

II. (£5.) THE HACHE HERD (Col. Thynne and Sir G. Ramsden, Bart.), **Brooklands Fryleigh** (4173), born 25th July, 1917, bred by C. Wordsworth, Brooklands, South Godstone, Surrey; s Kingswood (imported) Ynte (4047) d Brooklands (imported) Sietske 4th (14674), s d Bertus (5935).

III. (£2.)—W. AND R. WALLACE, Swangleys, Knebworth, Herts, **Knebworth Lilian** (25290), born 7th November, 1916; s Cradlehall (imported) Hollander 2nd (3737), d Cradlehall Lily (710), s d Cradlehall Culloden Prince (105).

R.—G. T. EATON, Thurston Hall, Framfield, **Petygard's Ciros,** born 30th October, 1916, bred by R. G. Buxton, Petygards, Swaffham, Norfolk; s Petygard's (imported) Bles Albert, d Petygard's Clare, s d Petygard's Foreman.

V.H.C.—LIEUT.-COL. W. E. HARRISON, Wychnor Park, Burton-on-Trent, **Colton Bram Roylette 2nd** (28040), born 27th March, 1917, bred by H. Brown, Colton Mains, Dumfernline; s Colton (imported) Vic Bram (3705), d Colton Roylette (6862), s d Colton Puritan (95).—W. AND R. WALLACE, **Attimore Pleasant Lass** (27306), born 18th September, 1917, bred by J. Masson, Attimore Hall, Hatfield; s Attimore Baron (3469), d Attimore Pleasant (5286).

H.C.—DUKE OF MARLBOROUGH, Blenheim Palace, Woodstock, **Gorstage Gouda 2nd,** born 14th July, 1914, bred by Mrs. M. H. Townsend, Llandudno Junction, North Wales; s Locklands Czar (1653), d Gorstage Gunst (1536), s d Gorstage Grenadier (241).—DUKE OF MARLBOROUGH, **Netherbroughton Lady,** born 15th May, 1916, bred by W. Broughton, Wartnaby, Melton Mowbray; s Garton (imported) Bravo (3895), d Tredegar Ladybird (19618), s d Tredegar Count (777).

C.—T. MANSFIELD, Winterbourne Court, Winterbourne, Glos., **Inwood Blackmore Vale** (18150), born 14th March, 1914, bred by Miss Guest, Inwood, Templecombe, Glos.; s Melford Rajah (1759), d Blackmore Pride (5742).

CLASS 122.—*British Friesian Heifer, not in-Milk, calved in* 1919 *or* 1920. [22 entries.]

I. (£10.)—THE HACHE HERD (Col. Thynne and Sir G. Ramsden, Bart.) Muntham Home Farm, Findon, Worthing, **Clockhouse Vic Rinze** (37868), born 26th March, 1919; s Clockhouse Vic Wouter (imported), d Clockhouse (imported) Rinze 7th, s d Buringa 50th (5511).

II. (£5.)—LIEUT.-COL. W. E. HARRISON, Wychnor Park, Burton-on-Trent, **Perling Jeltje 2nd** (42300), born 16th March, 1919, bred by Lord Rayleigh, Perling Place, Witham, Essex; s Perling (imported) Verwachting (4543), d Lavenham (imported) Jeltje 32nd (18382), s d Bravo (5268).

III. (£2.)—E. FURNESS, Hamel's Park, Buntingford, Herts, **Hamel's Chatty,** born 15th April, 1920; s Dunninald Gaatsomairschaap (6175), d Dunninald Daffodil (14520), s d Dunninald Baron (1167).

R.—G. HOLT THOMAS, North Dean House, North Dean, High Wycombe, Bucks, **Kingswood Ceres Myrtle** (39934), born 28th January, 1919, bred by H. Hale, Findon, Worthing, Sussex: s Hedges Second Series, d Kingswood Myrtle (9294), s d Kingswood Prince (341).

V.H.C.—MISS A. GUEST, Inwood, Templecombe, Somerset, **Inwood Dutch Jolly** (39748), born 28th June, 1919: s Rochford (imported) Johan (4399), d Inwood Dutch Doll (25110), s d Inwood Jock (2865).—W. AND R. WALLACE, Swangleys, Knebworth, Herts, **Knebworth Ynte's Countess,** born 16th January, 1920; s Kingswood (imported) Ynte (4047), d Knebworth Countess (29534), s d Wigginton (imported) Johan (4637).

H.C.—THE HACHE HERD, **Hache Teelt,** born 29th December, 1919; s Tredegar Prince of Holland, d Brooklands (imported) Tietske 4th, s d Bertus (5935).—DUKE OF MARLBOROUGH, Blenheim Palace, Woodstock, **Clockhouse Countess,** born 21st May, 1919, bred by T. Williams, West Hyde, Rickmansworth; s Clockhouse (imported) Rinlod (7513), d Gorstage Grafin 2nd (24740), s d Gorstage (imported) Mietjes Victor (3939).—W. AND R. WALLACE, **Knebworth Ynte's Lilian,** born 19th June, 1920; s Kingswood (imported) Ynte (4047), d Knebworth Lilian (25290), s d Cradlehall (imported) Hollander 2nd (3737).

C.—LIEUT.-COL. W. E. HARRISON, **Wychnor Roylette,** born 3rd January, 1920; s Perling (imported) Vic Bertus (4541), d Colton Bram Roylette 2nd (28040), s d Colton (imported) Vic Bram (3705).—G. T. EATON, Thurston Hall, Framfield, **Thurston Evelyn,** born 10th March, 1920; s Thiethis Victor (imported), d Gorstage Gloaming.—RANDALL BROS., Moulsoe Buildings, Newport Pagnall, **Eastern Betma** (38586), born 17th February, 1919, bred by — Parker, Eastern Hall, Norwich; s Bulkeley Max (4917), d Hoe Betty (21434), s d Hoe Cronje (1509).—SIR J. C. E. SHELLEY-ROLLS, BART., J.P., Avington, Winchester, **Avington Gentle 1st** (36938), born 10th August, 1919; s Milford Bute (6667), d Avington Minnie (5312).

CLASS 123.—*British Friesian Bull, calved in or before* 1919. [6 entries.]

I. (£10.)—MISS A. GUEST, Inwood, Templecombe, Somerset, **Osmaston (imported) Frits** (4293), born 26th February, 1914, bred by B. B. Sienema, Grouw, Holland; s Anema 4th (5403 F.R.S.), d Aaltje 5th (13487 F.R.S.), s d Frits (1372H. F.R.S.).

II. (**£5.**)—G. BISHOP, M.R.C.V.S., Brislington, Bristol, Somerset, **Cymric Mars,** born 31st August, 1917, bred by Lieut.-Col. G. R. Powell, Tynewydd, Glamorganshire ; s Cymric Fritz (imported), d Cymric Melba, s d Melford Jester.

III. (**£2.**)—E. FURNESS, Hamel's Park, Buntingford, Herts, **Kingswood Puritan,** born 16th January, 1917, bred by H. Hale, Tormare Farm, Findon, Worthing, Sussex ; s Kingswood (imported) Ynte (4047), d Kingswood Mayflower (9292), s d Kingswood Prince (341).

R.—DR. T. C. WILSON, Hill Manor, Wanborough, Wilts, **Kingswood Marquis,** born 30th January, 1918, bred by H. Hale, Kingswood Findon, Sussex ; s Kingswood (imported) Ynte (4047), d Kingswood Duchess (1986).

V.H.C.—T. MANSFIELD, Winterbourne Court, Winterbourne, **Rockwood Ghent Ceres** (Vol. ix), born 30th September, 1919, bred by Major Royenburg, Rockwood, Lydney ; s Bulkely (imported) Mietjie Ceres (3625), d Gorstage Ghent (1496).

CLASS 124.—*British Friesian Bull, calved in* 1920. [10 entries.]

I. (**£10.**)—DUKE OF MARLBOROUGH, Blenheim Palace, Woodstock, **Bladen Lord Verwachting,** born 10th April, bred by E. R. Debenham, Briantspuddle, Dorchester ; s Terling (imported), d Verwachting (4543), d Neeltje 3rd (imported), s d Ceres (4497 F.R.S.).

II. (**£5.**)—THE HACHE HERD (Col. Thynne and Sir G. Ramsden, Bart.), Muntham Home Farm, Findon, Worthing, **Hache Cerjan Ulysses,** born 7th July ; s Hedges Second Series (p. 1. 6427), d Wigginton Saakje 2nd (p. 1, 5019), s d Wigginton (imported) Johan (4637).

III. (**£2.**)—E. T. GREY, Cowley Farm, King's Weston, Bristol, **King's Weston Golf Victor,** born 23rd June ; s Haydon Golfer 2nd (8007), d Cuddington Greengage 2nd (28172), s d Edford Cuddington (5049).

R.—A. ALLEN, Manor House, Chesterblade, Shepton Mallet, **Kingswood Ynteseries,** born 17th June, bred by H. Hale, Tarmare, Findon, Worthing, Sussex ; s Hedges Second Series (6427), d Kingswood Gem (25202), s d Kingswood (imported) Ynte (4047).

V.H.C.—LIEUT.-COL. L. E. MORRICE, D.S.O., The Priory, Malmesbury, Wilts, **Malmesbury Royal Dutch,** born 10th January ; s Wychnor (imported) Yme (4709), d Wigginton Geraldine (13542).—SIR J. C. E. SHELLEY-ROLLS, BART., J.P., Avington, Winchester, **Avington Major,** born 12th April ; s Colton Vic Silence (7561), d Avington Magpie (5310).

H.C.—E. W. GRIFFIN, South Bank Farm, Corsham, **Malmesbury Hero** (14781), born 11th April, bred by Lieut.-Col. L. E. Morrice, The Priory, Malbury ; s Kingswood Hero (8121), d Murtleshum Ivy (10138), s d Kingswood Hero.

JERSEY.

(The Prizes in Class 125 were given by the English Jersey Cattle Society).

CLASS 125.—*Jersey Cow or Heifer, in-Milk, entered in or eligible for entry in the English Jersey Herd Book, sired in Great Britain or Ireland.* [15 entries.]

I. (**£5.**)—R. BRUCE WARD, Godington, Ashford, Kent, whole, **Ida,** born 15th March, 1915, bred by Major J. Baldwin, Alvechurch, Worcestershire ; s Antidote (10843), d Matilda, s d Marshall MacMahon (9695).

II. (£3.)—Mrs. Evelyn, Wotton House, Dorking, Surrey, whole, **Vervain's Bell 3rd** (Vol. xxv, p. 116), born 5th June, 1913, bred by A. W. Ruggles-Brise, Spain's Hall, Braintree, Essex; s Midsummer (11064), d Vervain's Bell (Vol. xvi, p. 406), s d Chorister (6815).

III. (£2.)—Mrs. Rudd, Felbridge Park Farm, East Grinstead, Sussex, whole, **Raleigh's Queen,** born 21st July, 1917, bred by Dr. H. Corner, Brook House, New Southgate; s Commodore, d Sea Queen, s d Sea Lord.

R. & V.H.C.—Mrs E. Watts, Eastwood Park, Falfield, Glos., whole, **Duckwing** (Vol. xxiv, p. 291), born 30th August, 1910, bred by — Smith-Barry, Stowell Park, Wilts; s Golden Swan (10260), d Daffodil, s d Groufille's Boy (6582).

V.H.C.—R. Bruce Ward, whole, **Evergreen,** born 4th September, 1916, bred by the Dowager Countess Roberts, Englemere, Ascot; s Catillon's Prince (11639), d Etiquette, s d Fleur de Lys (9583).

H.C.—Mrs. Hayes Sadler, Norsbury, Sutton Scotney, Hants, whole, **Dockweed,** born 16th March, 1916, bred by Thursby, Bramshaw, Lyndhurst, Hants; s Marshall McMahon, d Dock.—Mrs. Rudd, whole, **Fire King's Tidy,** born 2nd May, 1918; s Fire King, d Jolly Tidy, s d Cyclone 3rd.

C.—S. G. Hough, Springhouse Park, Theydon Bois, Essex, broken, **Nissa,** born 12th March, 1916, bred by H. Padwick, The Red House, West Ashling, Chichester; s Topsy's Noble (10116), d Delia, s d Kummassa (7895).—Hon. Mrs. Smyth, Ashton Court, Bristol, broken, **Grisette,** born 3rd March, 1916; s Beach Ronnie (12213), d Lissette 2nd (Vol. xxi, p. 351, imported), s d Combination (8845).

Class 126.—*Jersey Cow, in-Milk, calved before* 1918. [22 entries.]

I. (£10.)—R. Bruce Ward, Godington, Ashford, Kent, whole, **Ida,** born 15th March, 1915, bred by Major J. Baldwin, Alvechurch, Worcestershire; s Antidote (10843), d Matilda, s d Marshall MacMahon (9695).

II. (£5.)—Mrs. Evelyn, Wotton House, Dorking, Surrey, whole, **Vervain's Bell 3rd** (Vol. xxv, p. 116), born 5th June, 1913, bred by A. W. Ruggles-Brise, Spain's Hall, Braintree, Essex; s Midsummer (11064), d Vervain's Bell (Vol. xvi, p. 406), s d Chorister (6815).

III. (£2.)—W. Duncan Knight, Rapkyns, Horsham, Sussex, broken, **Distressed Lady,** born 26th April, 1915, bred by E. Cabot, St. Clement's, Jersey; s Dandy Actor, d Medora's Pride, s d King Aneme.

R. & V.H.C.—Mrs. Rudd, Felbridge Park Farm, East Grinstead, Sussex, whole, **Raleigh's Queen,** born 21st July, 1917, bred by Dr. H. Corner, Brook House, New Southgate; s Commodore, d Sea Queen, s d Sea Lord.

V.H.C.—R. Bruce Ward, whole, **Evergreen,** born 4th September, 1916, bred by the Dowager Countess Roberts, Englemere, Ascot; s Catillon's Prince (11639), d Etiquette, s d Fleur de Lys (9583).—Mrs. E. Watts, Eastwood Park, Falfield, Glos., whole, **Duckwing** (Vol. xxiv, p. 291), born 30th August, 1910, bred by — Smith-Barry, Stowell Park, Wilts; s Golden Swan (10260), d Daffodil, s d Groufille's Boy (6582).—J. H. N. Roberts, Weybeard's Farm, Harefield, Middlesex, whole, **Quaintness,** born 4th April, 1917, bred by E. E. Leonard, St. Owen's, Jersey; s Kingsway (12041), d Curious (20455, P.S.H.C.), s d Gilbert (11326).—Mrs. E. Watts, whole, **Merry Morn,** born 31st May, 1912, bred by J. S. Le Gresley, St. Martin's, Jersey; s Consul (11648), d Little Damozel (16772), s d Noble of Oaklands.

H.C.—MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, whole, **Dockweed,** born 16th March, 1916, bred by — Thursby, Bramshaw, Lyndhurst, Hants ; s Marshall McMahon, d Dock.

C.—HON. MRS. SMYTH, Ashton Court, Bristol, broken, **Grisette,** born 3rd March, 1916 ; s Beach Ronnie (12213), d Lisette 2nd (Vol. xxi, p. 351, imported), s d Combination (8845).—S. G. ASHER, Ascot Place, Ascot, whole, **Petunes Princess,** born 6th January, 1917, bred by F. J. Godel, St. Lawrence, Jersey ; s Anemone's Leda's Lad, d Petunes Poppy.—C. L. HILL, Harptree Court, East Harptree, near Bristol, broken, **Gay Lady's Lorraine,** born 16th January, 1916, bred by E. Cabot, St. Clement's ; s Merryweather (13025), d Gay Lady's Fountain (20094), s d Fountain Chief (10242).—E. A. STRAUSS, M.P., Kingston House, Abingdon, Berks, whole, **Derry's Fairy,** born 16th May, 1916, bred by J. Barette, St. Brelade's, Jersey ; s Belinda's Golden Jolly (Vol. xxx), d Tombette Lady F.S.C. (10549).—E. A. STRAUSS, M.P., whole, **Gipsy Amira,** born 10th December, 1914, bred by J. F. Brideaux, Jersey; s Hamptonne Grey (4995), d Gipsy Diana (18476), s d Diana's Champion (4367).

CLASS 127.—*Jersey Cow or Heifer, in-Milk, calved in* 1918. [11 entries.]

I. (£10.)—M. SPURWAY, Barvin Park, Potter's Bar, whole, **Waterfairy,** born 1st February, bred by Hon. Mrs. Tennant, St. Anne's Manor, Sutton, Loughborough ; s Firman (12294), d Waterwitch, s d Waterloo (11197).

II. (£5.)—COL. L. GISBORNE, C.M.G., Lingen Hall, Brampton Bryan, nearly whole, **Joy Laugh,** born 12th April, bred by W. R. Le Cocq, St. John's, Jersey ; s Jersey Volunteer (5354), d Joy (20633), s d General Cowslip H.C. (10960).

III. (£2.)—MRS. A. HAYES SADLER, Norsbury, Sutton Scotney, Hants, whole fawn, **Blondis Matchbox,** born 27th January, bred by Mrs. Limprivêe, Jersey ; s Blond's Golden Oxford, d Golden Matchbox, s d Golden Fern's Noble.

R. & H.C.—SIR G. S. WHITE, BART., Hollywood Tower, near Bristol, whole, **Ursanne Belle,** born 26th January, bred by J. Gandin, St. Martin's, Jersey ; s Pommern, d Ursanne Premiere.

H.C.—MRS. RUDD, Felbridge Park Farm, East Grinstead, Sussex, whole, **Fire King's Tidy,** born 2nd May, 1918 ; s Fire King, d Jolly Tidy, s d Cyclone 3rd.

C.—E. A. STRAUSS, M.P., Kingston House, Abingdon, Berks, whole, **Fairlawne Poppy 2nd,** born 7th November, bred by W. M. Cazalet, Fairlawme, Tonbridge, Kent ; s Sir Toby (12154), d Fairlawne Poppy (Vol. xxix), s d Bellringer (11223).

CLASS 128.—*Jersey Heifer, in-Milk, calved in or since* 1919. [13 entries.]

I. (£10.)—W. D. KNIGHT, Rapkyns, Horsham, Sussex, whole, **Rapkyns Perfume,** born 7th February ; s Structure, d Goddington Petune 2nd, s d Golden Chance's Noble.

II. (£5.)—R. BRUCE WARD, Godington, Ashford, Kent, whole, **Piquant,** born 21st April ; s Prometheus (13391), d Caper, s d Capsicum (10892).

III. (**£2.**)—C. L. HILL, Harptree Court, East Harptree, near Bristol, whole (tongue and switch black). **Star of Dawn,** born 25th Jamuary, bred by T. Bandains, St. Helier, Jersey; s Anemone's Boy (5520), d Excel's Pride (24110).

R. & V.H.C.—HON. MRS. SMYTH, Ashton Court, Bristol, whole, **Hopeful,** born 9th April, 1919, bred by H. B. Napier, Hobwell, Long Ashton; s Lord Oxford (12376), d Lady Hope (Vol. xxxi, p. 321), s d Sandboy (10082).

V.H.C.—MRS. E. WATTS, Eastwood Park, Falfield, Glos., whole, **Eastwood Dresden China,** born 21st April, 1919; s Fairfax (12607), d Capsicum's Ixia (Vol. xxviii. p. 225), s d Capsicum (10892).—C. L. HILL, whole (tongue black. switch fawn), **Devonshire Pet,** born 22nd January, bred by E. A. Bree, Crouville, Jersey; s La Sainte's King Onyx (5423), d Maisoniere's Rosie (22309).

H.C.—Col. L. GISBORNE, C.M.G., Lingen Hall, Brampton Bryan, broken, **Mille Guyon Sleepless,** born 23rd April, bred by J. Gart ell, St. John's, Jersey; s Sleeper (5443), d Mille Guyon Hip H.C. (22280), s d Golden Fern's Noble (4570).

CLASS 129.—*Jersey Heifer, calved in* 1920. [26 entries.]

I. (**£10.**)—MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, whole fawn, **Bayleaf's Ruth,** born 19th April; s Bayleaf's Cid, d Wotton Catriona, s d Red Cloud.

II. (**£5.**)—R. BRUCE WARD, Godington, Ashford, Kent, whole, **Sunrose,** born 19th May, bred by A. Etringer, Hemel Hempstead, Herts; s Rose Prince, d Sunshine, s d Dolly's Son (12914).

III. (**£2.**)—MRS. E. WATTS, Eastwood Park, Falfield, Glos., whole, **Tinker Bell,** born 25th May, bred by Mrs. E. de Knoop, Calveley Hall, Tarporley, Cheshire; s Daisy's Boy (12895), d Calveley Bluebell (Vol. xxx, p. 240), s d Oxjesty's Lad (11799).

V.H.C.—LIEUT.-COL. THE HON. H. G. HENDERSON, Buscot Park, Faringdon, whole, **Snow Lady,** born 24th April; s Monica's Pioneer (13035), d Cowslip's Golden Snowflake (Vol. xxv, p. 305), s d Cowslip's Golden Noble (10568).—LIEUT.-COL. THE HON. H. G. HENDERSON, whole, **Folly,** born 1st April; s Monica's Pioneer (13035), d Josephine (Vol. xxvii, p. 302), s d Jersey Nobleman (11006).—MRS. RUDD, Felbridge Park Farm, East Grinstead, whole, **Caramel,** born 10th February; s Fire King, d Slim Jim's Lass, s d Slim Jim.

H.C.—MISS C. B. LUCAS, Sutton House, Iford, near Lewes, whole, **Culverden Pioneers Princess,** born 11th August; s Culverden Pioneer, d Culverden Petune's Princess, s d Petune's Lad.—J. H. N. ROBERTS, Weybeard's Farm, Harefield, Middlesex, broken, **Masterman's Golden Cidonia,** born 18th June, bred by Mrs. Ames, Manor House, Thornham, King's Lynn; s Masterman of Oaklands (13020), d Park Mayfire, s d The Cid (12473).—SIR G. S. WHITE, Bart., Hollywood Tower, near Bristol, whole, **Fairy of Hollywood,** born 29th June; s Beuveland Emperor, d Freesia of Hollywood, s d Hero of Hollywood.

C.—J. H. N. ROBERTS, whole, **Golden Fern Marionette,** born 5th May; s Marionette's Merry Boy (13017), d Noble Fern Maracas (Vol. xxxi, p. 357), s d Golden Fern's Noble (10626).

CLASS 130.—*Jersey Bull, calved in* 1917 *or* 1918. [4 entries.]

I. (£10.)—MISS C. B. LUCAS, Sutton House, Iford, near Lewes, mulberry, **Culverden Pioneer,** born 18th April, 1918; s Pioneer's Noble, d La Sente's Fairy, s d Self Acting.

II. (£5.)—W. D. KNIGHT, Rapkyns, Horsham, Sussex, nearly whole, **Rapkyns Black Knight,** born 19th June, 1918; s Mulcaster, d Green Cliff Daisy 3rd, s d Fontaine's Hope.

III. (£2.)—MRS. E. WATTS, Eastwood Park, Falfield, Glos., broken, **Wotton Beauteous Cloud,** born 20th September, 1918, bred by Mrs. Evelyn, Wotton House, Dorking, Surrey; s Red Cloud (11818), d Bessy's Beauty 5th (Vol. xxv, p. 272).

R.—SIR G. S. WHITE, BART., Hollywood Tower, near Bristol, whole, **Beuvelande Emperor,** born 6th July, 1918, bred by S. De La Haye, St. Martin, Jersey; s Dimple Golden Plymouth, d Georgina 11th, s d Campamile's Emperor.

CLASS 131.—*Jersey Bull, calved in* 1919. [7 entries.]

I. (£10.)—M. SPURWAY, Barvin Park, Potter's Bar, whole, **Makepeace,** born 24th June, bred by Mrs. Austin, Ellern Mead, Totteridge, Herts; s Primate (12420), d Mascotte (Vol. xxxi), s d Reynard the Fox (12124).

II. (£5.)—R. BRUCE WARD, Godington, Ashford, Kent, **Pilgrim,** born 14th April; s Prometheus (13391), d Evergreen, s d Catillon's Prince (11639).

III. (£2.)—H. C. BAKER, Oaklands, Almondsbury, Glos., whole, **The Bosun,** born 3rd February, bred by R. Bruce Ward; s Boaz (112846), d Melody 3rd.

R.—HON. MRS. SMYTH, Ashton Court, Bristol, whole, **Lizzie's Boy,** born 26th February; s Lord Oxford (12376), d Lizzie (Vol. xxviii, p. 394), s d Lissom (11037).

V.H.C.—MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, broken, **Gauntlett's Majesty,** born 9th September, bred by Dr. Corner, Brook House, Southgate, Middlesex; s Gauntlett's Raleigh, d Majesty's Peggy, s d Oxford's Majesty.

CLASS 132.—*Jersey Bull, calved in* 1920. [23 entries.]

I. (£10.)—MRS. EVELYN, Wotton House, Dorking, Surrey, whole, **Wotton Airman,** born 29th March; s Red Cloud (11818), d Dairymaid (Vol. xxvi, p. 267), s d Midsummer (11064).

II. (£5.)—MRS. RUDD, Felbridge Park Farm, East Grinstead, whole, **Cardiff,** born 24th March; s Fire King, d Meadow Vale Pride, s d Cyclone 3rd.

III. (£2.)—MRS. GATHORNE HILL, Claverton Manor, Bath, whole, **Royal,** born 20th April; s Wotton Rainbow (12809), d Jenny, s d Very Clear (12433).

R.—LORD ROUNDWAY, Roundway Park, Devizes, whole, **Roundway Courtier,** born 13th June; s Juanita's Raleigh, d Sunny Maid's Cowslip, s d Cowslip's Golden Noble.

V.H.C.—HON. MRS. SMYTH, Ashton Court, Bristol, whole, **General Hope,** born 4th May; s General Mikado (13275), d Lady Hope (Vol. xxxi. p. 321), s d

Sandboy (10082).—Lord Roundway, whole, **Myrtus,** born 22nd February, bred by Mrs. Austin, Ellerne Meade, Totteridge, Herts; s President, d Mistletoe s d Harriet's Jolly.—Mrs. E. Watts, Eastwood Park, Falfield, Glos., whole, **The Slasher,** born 29th February, bred by N. J. Perree, St. Mary, Jersey: s Xenia's Sultan, d Daydream 4th.

H.C.—E. Birkett, Beddlestone Farm, Brook, Ashford, Kent, dark fawn, **Tiny Sybil's Lad** (Vol. xxxii), born 19th March, bred by P. Le Brocq, St. Owen's, Jersey; s Sybil's Gamboge 3rd (5554 H.C., P.S.), d Tiny Maiden (20284 H.C. P.S.), s d Maiden's Glory (4734 H.C., P.S.).—Col. L. Gisborne, C.M.G. Lingen Hall, Brampton Bryan, whole, **La Maitreries Masterman,** born 2nd January, bred by E. J. Andre, St. Martin, Jersey; s Masterman of Oaklands, d La Maitreries April Star (22583 P.S., H.C.), s d Slim Jim (5097 P.S., H.C.).—Lieut.-Col. Hon. H. G. Henderson, Buscot Park, Faringdon, whole, **Girlish Dairy Lad,** born 3rd March, bred by H. Lawford, St. Brelade, Jersey; s Dairylike's Majesty (5380), d Girlish (24209), s d Jolly Golden Lad (5120).—S. G. Hough, Springhouse Park, Theydon Bois, Essex, nearly whole, **Spring Gambowlina Lad,** born 23rd June; s Bowlina's Lad, d Golden Gamboline 2nd, s d General Light (12312).—R. Bruce Ward, Godington, Ashford, Kent, **Pride of Kent,** born 4th February; s Prometheus (13391), d Ida, s d Antidote (10843).

C.—Sir G. S. White, Bart., Hollywood Tower, near Bristol, whole, **Talisman of Hollywood,** born 13th May; s Lord Rhondda, d Trinket, s d Elevator. —Sir G. S. White, Bart., whole, **Islander of Hollywood,** born 11th May; s Manor Hussy 3rd's Sweeper, d Ivy Rose 3rd.

GUERNSEY.

(£20 towards the Prizes in the Guernsey Classes were given by the English Guernsey Cattle Society).

Class 133.—*Guernsey Cow, in-Milk, calved before* 1918. [10 entries.]

I. (£10.)—H.R.H. The Duchess of Albany, Claremont, Esher, Surrey, red, and white, **Trequean Lady 2nd** (11770), born 20th July, 1915, bred by W. Penrose, Trequean, Breage, Cornwall; s Sequel's Galore 2nd (2849), d Lady of the Spurs (7343), s d Shamrock of the Spurs P.S. (R.G.A.S., 1561).

II. (£5.)—G. F. Ferrand, Morland Hall, Alton, Hants, dark fawn and white, **Fussey's Dora** (10036), born 21st July, 1912, bred by J. T. White, La Roussaillerie, Guernsey; s Clairvoyante's Sequel (2279 P.S.), d Fussey (3688 F.S.).

III. (£2.)—G. F. Ferrand, fawn and white, **Morland Diamond** (10847), born 21st July, 1914; s Chieftain of Hawkley (2238), d Rushington Shamrock 3rd (8243), s d Bonnie's Pride (1803).

R.—Mrs. W. H. Palmer, Murrell Hill, Binfield, Berks, lemon and white, **Donata 7th of Warren Wood** (9949), born 1st January, 1913, bred by the late J. T. Smail, Warren Wood, Kent; s Godolphin Bar Gold (2136), d Donnington Eversweet (6113), s d Donnington Lad (1369).

CLASS 134.—*Guernsey Heifer, in-Milk, calved in* 1918. [7 entries.]

I. (**£10.**)—J. B. BODY, Hindhead Court, Hindhead, Surrey, fawn and white, **Lynchmere Rosy** (13731), born 12th August, bred by Mrs. Pratt Barlow, Lynchmere House, Haslemere; s Sequel's Delight 2nd (3403), d Rosey of Goodnestone, s d Gunner 3rd (2459).

II. (**£5.**)— G. F. FERRAND, Morland Hall, Alton, Hants, fawn and white, **Morland Topsy** (13771), born 31s May; s Bickleigh 2nd (3470), d Topsy of La Hougue (10380), s d Clara's Sequel (2207 P.S.).

III. (**£2.**)—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, Devon, dark fawn, **Elfordleigh Sylvia,** born 10th December; s Stagenhoe Charmant 4th (3036), d Governs Golden (10719).

R.— J. B. BODY, fawn and white, **Claremont Miriam** (13342), born 1st January, bred by H.R.H. the Duchess of Albany, Claremont; s Duvaux Gift (2938), d Claremont Romany (10564), s d Rochampton Comte de Paris 3rd (2635).

CLASS 135.—*Guernsey Heifer, calved in* 1919. [6 entries.]

I. (**£10.**)—J. B. BODY, Hindhead Court, Hindhead, Surrey, fawn and white. **Lynchmere Glen 2nd** (14569), born 13th February, bred by Mrs. Pratt Barlow, Lynchmere House, Haslemere; s Polly's Ideal of Maison le Bas (3198), d Tregonning Glen (10989), s d Robert's Boy's Sequel (2496).

II. (**£5.**)—J. C. FORSTER, Clatford Mills, Andover, fawn and white, **Clatford Marie du Moulin 4th,** born 21st January; s Clatford Mars (3482), d Clatford Marie du Moulin 3rd (11930), s d Clatford Jewel (2717) (late Frances Jewel 17th).

III. (**£2.**)—MRS. W. H. PALMER, Murrell Hill, Binfield, Berks, lemon and white, **Murrell Delight** (14620), born 25th April; s Murrell Lord Roberts (3375), d Donata 7th of Warren Wood (9949), s d Godolphin Bar Gold (2136).

R.—E. R. DEBENHAM, Briantspuddle, near Dorchester, fawn and white, **Mulberry 4th of Bel-Air** (14616), born 21st January, bred by the Hon. C. R. Molesworth, Hotel Bel-Air, Sark, C.I.; s My Delight of Park Farm (3753 P.S., R.G.A.S.), d Mulberry of Bel-Air (9689 P.S., R.G.A.S.), s d Defencer (2152 P.S., R.G.A.S.).

CLASS 136.—*Guernsey Heifer, calved in* 1920. [8 entries.]

I. (**£10.**)—J. C. FORSTER, Clatford Mills, Andover, orange, fawn and white, **Clatford Meadow Sweet 10th,** born 21st April; s Clatford Mars (3482), d Clatford Meadow Sweet 8th (13346), s d Lynchmere Charmant 4th (3177).

II. (**£5.**)—J. C. FORSTER, orange, fawn and white, **Clatford Meadow Sweet 11th** born 27th April; s Roberts Boy's Sequel (2496), d Clatford Meadow Sweet 2nd (8401 M.R. 75), s d Prince (58 P.S., R.A.A.S.), King's Cup (1910).

III. (**£2.**)—H.R.H. THE DUCHESS OF ALBANY, Claremont, Esher, Surrey, fawn and white, **Claremont Princess Daisy** (Vol. xxxvii, E.G.H.B.), born 20th, August; s Brittleware Princeling (3282), d Morland Daisy (12256), s d Maudette's Jewel 2nd (P.S., R.G.A.S., 2956).

R.—MRS. W. H. PALMER, Murrell Hill, Binfield, Berks, lemon and white, **Murrell Demure,** born 16th May; s Murrell Jolly Laddie (3766), d Murrel Dainty (13775), s d Murrell Fido (3009).

Class 137.—*Guernsey Bull, Calved in* 1917 *or* 1918. [4 entries.]

I. (£10.)—Mrs. W. H. Palmer, Murrell Hill, Binfield, Berks, lemon, **Murrell Governor's King of L'Etiennerie** (3765), born 8th April, 1917, bred by Mrs. L. Le Prevost, L'Etiennerie, Castel, Guernsey; s Governor's King's Prize (3473), d Lily 2nd of Les Bordages (12363), s d Governor of the Chene (1297).

II. (£5.)—A. C. Beatty, Calehill Park, Little Chart, Kent, fawn, **Murrell Golden Lad,** born 12th October, 1918, bred by H. Palmer, Wokingham; s Murrell Jolly Boy (3193), d Murrell Golden Lady (12268).

III. (£2.)—Captain Phipps Hornby, Somerton, Somerset, red and white, **Archer of the Camp,** born 6th September, 1918, bred by — Lanoe, Camp, Guernsey; s May Boy of Mont Plaisant, d Fern Fourth of Camp, s d Squire 5th of Beaulieu.

R.—Miss C. E. Hambro, The Lodge, Tadworth, Surrey, fawn and white, **Kingswood Reliance,** born 21st June, 1918, bred by C. Kitts, Guernsey; s Duke of Vimiera, d Lil of Clovelly, s d Governor of Corbinez.

Class 138.—*Guernsey Bull, calved in* 1919. [10 entries.]

I. (£10.)—J. C. Forster, Clatford Mills, Andover, light red and white, **Clatford Rosie's Sequel of Vimiera,** born 27th August, bred by F. Belloir, Vimiera, St. Peter Port; s Governor 3rd of the Grantez (4089 P.S., R.G.A.S.), d Rosie of Vimiera (15520 P.S., R.G.A.S.), s d Governor of the Corbinez (3302 P.S., R.G.A.S.).

II. (£5.)—J. B. Body, Hindhead Court, Hindhead, Surrey, lemon, **Lynchmere Lord Roberts 15th** (3982), born 12th June, bred by Mrs. Pratt Barlow, Lynchmere House, Haslemere; s Robert's Boy's Sequel (2496), d Citron 26th (9352), s d Charmant 4th of the Gron (2124).

III. (£2.)—Lord Poltimore, Court Hall, North Molton, North Devon, fawn and white, **Pearl's Majestic** (3999, 4325 P.S., R.G.A.S.), born 27th April, bred by Mrs. T. Le Provost, L'Etiennerie, Castel, Guernsey; s Queen's Fancy (4038 P.S., R.G.A.S.), d Nicolle's Pearl (16975 P.S., R.G.A.S.), s d Governor's Pearl (3428 P.S., R.G.A.S.).

R.—H.R.H. The Duchess of Albany, Claremont, Esher, Surrey, fawn and white, **Claremont Eros** (3870), born 6th September; s Wickham May King 3rd (3620), d Hartfield Venus (8538), s d Gay Boy (2020).

V.H.C. Major E. S. Jackson, North Cheriton, Templecombe, fawn and white, **Hunquets de Bas Espoir,** born 26th July, bred by W. H. Guilbert, St. Andrew, Guernsey, Hunquets de Bas St. Andrew's, Guernsey; s Lenore's Sequel of Vimiera, d Hunquets de Bas Esperance's Souvenir.

H.C.—G. P. Sanday, Puddington Hall, Neston, Birkenhead, fawn and white, **Puddington Jewel** (4011), born 21st March, bred by Mrs. Martineau, Sunningdale, Berks; s Hurst Fredai Jewel 2nd (3543), d Ivy May Rose of the Masses (16225 P.S.), s d Governor of Carteret (3421).

Class 139.—*Guernsey Bull, calved in* 1920. [4 entries.]

I. (£10.)—Mrs. W. H. Palmer, Murrell Hill, Binfield, Berks, lemon and white, **Murrell Desmond,** born 14th May; s Murrell Governor's King of L'Etiennerie (3765), d Donata 7th of Warren Wood (9949), s d Godolphin Bar Gold (2136).

II. (£5.)—J. B. Body, Hindhead Court, Hindhead, Surrey, fawn and white, **Hindhead Peter,** born 4th August; s Bicton Plumbago (3648), d Bighton Nacre (10490).

III. (£2.)—Mrs. R. C. Bainbridge, Elfordleigh, Plympton, Devon, fawn and white, **Elfordleigh Hamill,** born 4th May; s Hamill of Marazion (3334), d Trequean Maggie 3rd (11742), s d Trequean Arthur (2675).

KERRY.

(£25 10s. towards the prizes in the Kerry Classes were given by the English Kerry and Dexter Cattle Society).

Class 140.—*Kerry Cow or Heifer, in-Milk, calved in or before* 1918. [6 entries.]

I. (£10.)—Lady Fitzgerald, Buckland House, Faringdon, Berks, **Buckland Strawberry,** born 16th May, 1916; s Raspberry Duke (331), d Walton Harebell (1619 Vol. xiii, p. 28 F.S.).

II. (£5.)—Captain N. Zambra, M.C., Hattingley House, Medstead, Hants, **Castle Lough Kitty 3rd,** born 27th April, 1915, bred by J. Hilliard, Killarney; s Castle Lough Ranger, d Castle Lough Kitty 2nd, s d Waterville Rover.

Class 141.—*Kerry Heifer, calved in* 1919 *or* 1920. [6 entries.]

I. (£10.)—Lady Fitzgerald, Buckland House, Faringdon, Berks, **Buckland Angel Clare,** born 11th October, 1920; s Buckland Battle, d Valencia Princess (1756 Vol. xiv, p. 36), s d Gort Prince (636 D.R.).

II. (£5.)—Captain N. Zambra, M.C., Hattingley House, Medstead, Hants, **Hattingley Hearty** (Vol. xxi), born 28th April, 1920; s Waterville Lord (424), d Ratmore Extract (2180), s d Ratmore Arab (366).

III. (£2.)—L. Currie, Minley Manor, Farnborough, Hants, **Minley Lodestar,** born 16th October, 1919; s Valencia Lord 3rd (370), d Minley Angel (2154), s d Minley Lad (324).

R.—Lady Fitzgerald, **Buckland Marriage Bell,** born 8th February, 1920, s Minley Victory (406), d Valencia Bell (2199 Vol. xix, p. 37), s d Duv Ratmore (280).

H.C.—L. Harrison & Co., Ltd., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, **Mangerton Dewdrop 4th,** born 14th February, 1919, bred by T. Waite, Highlands, Redhill, Surrey; s Mangerton Gortmore Drops (361), d Mangerton Dewdrop 3rd (2064), s d Kilmorna Lord 29th (341).

Class 142.—*Kerry Bull, calved in* 1918, 1919 *or* 1920. [4 entries.]

I. (£10.)—L. Harrison & Co., Ltd., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, **Valencia Linksman** (960), born 24th April, 1919, bred by The Knight of Kerry, Valencia Island, Co. Kerry; s Valencia Chieftain (806), d Valencia Meta (4122), s d Valencia Lord 1st (782).

II. (£5.)—Lady Fitzgerald, Buckland House, Faringdon, Berks, **Buckland Viking,** born 23rd April, 1920, bred by L. Currie, Minley Manor, Farnborough, Hants; s Minley Alexander, d Minley Audrey, s d Minley Mars (362).

III. (£2.)—L. Currie, Minley Manor, Farnborough, Hants, **Watershun Ratmores,** born 23rd December, 1919, bred by Captain R. E. Palmer, Oaklands Park, Newdigate, Surrey: s Mangerton Dirmot 3rd (388), d Ratmore Album 2nd (2179), s d Ratmore Hawthorn (306).

R.—Captain N. Zambra, M.C., Hattingley House, Medstead, Hants, **Waterville Lord** (424), born 30th January, 1918, bred by Captain R. E. Palmer, Oaklands Park, Newdigate; s Kilmorna Lord 29th (821), d Kilmorna Waterville 10th (.142), s d Kilmorna Lord 13th (750).

DEXTER.

Class 143.—*Dexter Cow or Heifer, in-Milk, calved in or before* 1918. [13 entries.]

I. (£10.)—Lady K. Hare, Brokenhurst Park, Brokenhurst, Hants, black, **Gort Peach 9th** (2496), born 10th February, 1913, bred by D. M. Rattray, Ballybunion, Co. Cork; s Gort Fred 2nd (584), d Gort Peach (2235).

II. (£5.)—A. C. King, Braishfield Manor, Romsey, Hants, black, **La Mancha Madeline** (2272), born March, 1913.

III. (£2.)—H. G. Jones, Downford, Mayfield, Sussex, black, **Downford Deutzia,** born June, 1918.

R.—Mrs. Nutt, Hampton-in-Arden, Warwickshire, black, **Fillongley Favourite** (2242 Vol. xvi, p. 61).

V.H.C.—G. M. Gibbs, Gratwicke Hall, Flax Bourton, Somerset, red, **Barrow Buttercup 6th,** born 19th April, 1914, bred by H. M. Gibbs, Barrow Court, Flax Bourton; s Barrow Bacchus (419), d Barrow Buttercup 2nd, s d Barrow Count (383).—Mrs. Nutt, **Fillongley Farola,** born October 23rd, 1916; s General Manager (523), d Dewberry (2239), s d Sloeberry (494).

H.C.—H. G. Jones, black, **Downford Dittany,** born June, 1918.—T. A. Stephens, Hookstile House, South Godstone, Surrey, black, **Sunshine of Hookstile,** born 10th May, 1918; entered in Herd Book by inspection.

C.—Mrs. Nutt, black, **Fillongley Farina** (2326 Vol. xvii, p. 55), born in 1915.

Class 144.—*Dexter Heifer, calved in* 1919 *or* 1920. [17 entries.]

I. (£10.)—Mrs. Nutt, Hampton-in-Arden, Warwickshire, black, **Fillongley Forest Fairy,** born 16th July, 1919; s Fillongley Forester (630), d Barrow Bracelet (1726).

II. (£5.)—Rev. W. W. Joyce, Charles Rectory, S. Molton, Devon, black, **Jester,** born 8th February, 1920; s Charlemagne (604), d Jessie (Barrow) (2086).

III. (£2.)—Lady K. Hare, Brokenhurst Park, Brokenhurst, Hants, black, **Brokenhurst Rose** (2593), born 1st January, 1919; s Brokenhurst Blighty (581), d Brokenhurst Red Rose (2230).

R.—E. P. Peyton, Woodcote Lodge, Kenilworth, black, **Pulcinella 10th** (Vol. xx, p. 73), born 27th June, 1919; s Brokenhurst Coy Boy (539), d Pulcinella 2nd (Vol. xv, p. 66), s d Paganini (532).

H.C.—Rev. W. W. Joyce, red, **Ladybird,** born 4th March, 1920; s Charlemagne (604), d Tortoiseshell 3rd, s d Cowbridge General (385).—T. A. Stephens, Hookstile House, South Godstone, Surrey, black, **Hookstile Lady Macbeth,** born 30th June, 1920; s Summerhill George (685), d Gamma (2108), s d Cowbridge General (385).

C.—Mrs. Nutt, **Fillongley Forest Fawn,** born 19th July, 1919; s Fillongley Forester (630), d Who's Who (2540), s d Barrow Orphan (498).

Class 145.—*Dexter Bull, calved in* 1918, 1919 *or* 1920. [10 entries.]

I. (£10.)—H. G. Jones, Downford, Mayfield, Sussex, back, **Downford Dandy,** born January, 1918, bred by R. T. Robertson, Malahide.

II. (£5.)—J. H. Wootton, Byford, Staunton-on-Wye, Hereford, red, **Byford Banner,** born 10th April, 1919; s Bryn Lavengo, d Byford Beauty.

III. (£2.)—Mrs. Nutt, Hampton House, Hampton-in-Arden, red, **Fillongley Forest Fire,** born August, 1919; s Fillongley Forester (630), d Gloriana (2492), s d Barrow Orphan (498).

R.—A. C. King, Braishfield Manor, Romsey, Hants, black, **La Mancha True Blue** (Vol. xxi), born 23rd February, 1919, bred by J. Neill, The Park, Killarney; s Duv Champion (625), d Duv Orange (2639), s d Duv Listry (600).

H.C.—G. M. Gibbs, Gratwicke Hall, Flax Bourton, Somerset, black, **Barrow Mr. Murphy 2nd,** born 11th March, 1919, bred by H. M. Gibbs, Barrow Court, Flax Bourton, Somerset; s Barrow Beau 3rd (622), d Barrow Miss Murphy 3rd, s d Barrow Desmond (394).—E. P. Peyton, Woodcote Lodge, Kenilworth, black, **Bold Boy** (623), born 22nd March, 1918, bred by the Rev. R. L. Simkin, Durbridge, Redmarley, Glos.; s Brokenhurst Coy Boy (539), d Oakridge Bery 2nd (2277), s d Oakridge Grandaddy (510).

(The Prizes in Class 146 were given by the English Kerry and Dexter Cattle Society).

Class 146.—*Dexter Bull, calved in* 1920, *whose sire and dam were entered in the English Kerry and Dexter or Royal Dublin Society's Herd Book.* [12 entries.]

I. (£10.)—Lady K. Hare, Brokenhurst Park, Brokenhurst, Hants, black, **Brokenhurst Penny 2nd,** born 17th March, 1920; s Brokenhurst Rufus (601), d Harley Penelope (1768), s d Kingswood Comely Boy (264).

II. (£3.)—H. G. Jones, Downford, Mayfield, Sussex, black, **Downford Doson,** born 7th April, 1920; s Downford Dandy, d Downford Daisy.

III. (£2.)—Mrs. Nutt, Hampton-in-Arden, Warwickshire, black, **Fillongley Little Fool,** born 9th April, 1920; s April Fool, d Fillongley Fieldfare, s d Answers (555).

R.—E. Davies, Pontarfran, Brecon, black, **Pontarfran Rifleman,** born 29th January, 1920; s Fillongley Forester, d Ardudwy, s d Fillongley Foreman.

H.C.—G. M. Gibbs, Gratwicke Hall, Flax Bourton, black, **Barrow Duke 6th,** born 26th March, 1920; s Oakbridge S, d Barrow Duchess 9th, s d Oakridge

Marston Jack (512).—Mrs. Leatham, The Manor, Bagendon, Cirencester, black, **Bagendon Profiteer,** born 19th May, 1920; s Bagendon Paying Guest 620), d Bagendon Tortoiseshell 4th, s d Cowbridge Sunny Boy (385).

C.—E. Davies, black, **Pontarfran Sunny Jim,** born 26th February, 1920; s Fillongley Forester, d Fillongley Foam.—A. C. King, Braishfield Manor, Romsey, Hants, black, **Braishfield Good Shot** (Vol. xxi), born 20th June, 1920; s Black Mark (643), d Braishfield Goodness (2455), s d Home Rule (563).

SPECIAL PRIZE.

Given by the English Kerry and Dexter Cattle Society.

The Devonshire Challenge Cup, for the Best Animal in Classes 143 *to* 146, *bred by Exhibitor, and entered in or eligible for the English Kerry and Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.*

The Certificate of Award of the English Kerry and Dexter Cattle Society will be given to the owner of the winning Animal on each occasion the Cup is competed for.

I.—Lady K. Hare, Brokenhurst Park, Brokenhurst, Hants, black, **Brokenhurst Penny 2nd,** born 17th March, 1920; s Brokenhurst Rufus (601), d Harley Penelope (1768), s d Kingswood Comely Boy (264).

R.—J. H. Wootton, Byford, Staunton-on-Wye, Hereford, red, **Byford Banner,** born 10th April, 1919; s Bryn Lavengo, d Byford Beauty.

MILK TEST.

(See Regulation 64.)

Class 147.—*Cow, in-Milk, of any breed or cross, under* 950*lbs. live weight, yielding the largest quantity of milk of normal character, containing at each time of milking,* 12 *per cent. of total solids, of which not less than* 3 *per cent. shall be fat, the period of lactation being taken into consideration.* [45 entries.]

I. (**£10.**)—G. Berry, Withers, Mt. Bures, Bures, Suffolk, nearly whole, **Nimrod's Dinah 4th,** born 11th September, 1915; s Thorn's Aurelius 2nd, d Nimrod's Dinah 3rd, s d Postmaster. (Last calf January 1, 1921)

II. (**£5.**)—Mrs. Evelyn, Wotton House, Dorking, Surrey, whole, **Vervain's Bell** 3rd (Vol. xxv, p. 116), born 5th June, 1913, bred by A. W. Ruggles-Brise, Spain's Hall, Braintree, Essex; s Midsummer (11064), d Vervain's Bell (Vol. xvi, p. 406), s d Chorister (6815). (Last calf January 9, 1921).

III. (**£2.**)—S. G. Asher, Ascot Place, Ascot, whole Jersey, **Dainty,** born 14th January, 1914, bred by Mrs. Weston, Wokingham, Berks; s Victor (11187), d Damson. (Last calf December 6, 1920).

R. & H.C.—MRS. E. WATTS, Eastwood Park, Falfield, Glos., whole, **Duckwing** (Vol. xxiv, p. 291), born 30th August, 1910, bred by — Smith-Barry, Stowell Park, Wilts ; s Golden Swan (10260), d Daffodil, s d Groufille's Boy (6582). (Last calf March 29, 1921).

H.C.—A. C. KING, Braishfield Manor, Romsey, Hants, black, **La Mancha Madeline** (2272), born March, 1913.

C.—MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, whole, **Dockweed,** born 16th March, 1916, bred by — Thursby, Bramshaw, Lyndhurst, Hants ; s Marshall McMahon, d Dock. (Last calf March 19, 1921).—MRS. RUDD, Felbridge Park Farm, East Grinstead, Sussex, whole **Raleigh's Queen,** born 21st July, 1917, bred by D . H. Corner, Brook House, New Southgate ; s Commodore, d Sea Queen, s d Sea Lord.—S. G. ASHER, Ascot Place, Ascot, whole, **Petunes Princess,** born 6th January, 1917, bred by F. J. Godel, St. Lawrence, Jersey ; s Anemone's Leda's Lad, d Petunes Poppy. (Last calf April 14, 1921).—MISS C. BYNG LUCAS, Sutton House, Iford, near Lewes, whole, **Cowslip 74th,** born 14th December, 1916, bred by H. Falla, Jersey ; s General Cowslip, d Cowslip 62nd, s d Agatha Oxford Noble.

CLASS 148.—*Cow, in-Milk, of any breed or cross, 950lbs. live weight or over, yielding the largest quantity of milk of normal character, containing at each time of milking, 12 per cent. of total solids, of which not less than 3 per cent. shall be fat, the period of lactation being taken into consideration.* [45 entries.]

I. (**£10.**)—W. AND R. WALLACE, Swagleys, Knebworth. Herts, **Attimore Pleasant Lass** (27306), born 18th September, 1917, bred by J. Masson, Attimore Hall, Hatfield ; s Attimore Baron (3469), d Attimore Pleasant (5286).

II. (**£5.**)—G. F. FERRAND, Morland Hall, Alton, Hants, fawn and white, **Morland Diamond** (10847), born 21st July, 1914 ; s Chieftain of Hawkley (2238), d Rushington Shamrock 3rd (8243), s d Bonnie's Pride (1803).

III. (**£2.**)—R. BRUCE WARD, Godington, Ashford, Kent, whole, **Ida,** born 15th March, 1915, bred by Major J. Baldwin, Alvechurch, Worcestershire ; s Antidote (10843), d Matilda, s d Marshall MacMahon (9695). (Last calf February 13, 1921).

R. & H.C.—J. H. CHICK, Wynford Eagle, Dorchester, Dorset, **Wynford Pill C** (292), born 23rd July, 1913, ; s Compton Moses (7015), d Wynford Pink 1st (353), s d Compton Rattler (6309.)

H.C.—J. H. CHICK, **Wynford Floss C** (476), born 8th October, 1914 ; s Wynford Charmer (7301), d Wynford Flower B (201), s d Browda Captain (5440).—G. F. FERRAND, Morland Hall, Alton, Hants, dark fawn and white, **Fussey's Dora** (10036), born 21st July, 1912, bred by J. T. White, La Roussaillerie, Guernsey ; s Clairvoyante's Sequel (2279 P.S.), d Fussey (3688 F.S.). (Last calf March 2, 1921).

C.—MRS. E. WATTS, Eastwood Park, Falfield, Glos., whole, **Merry Morn,** born 31st May, 1912, bred by J. S. Le Gresley, St. Martin's, Jersey ; s Consul (11648), d Little Damozel (16772), s d Noble of Oaklands. (Last calf April 8, 1921).

SPECIAL PRIZES.

GIVEN BY THE ENGLISH KERRY AND DEXTER CATTLE SOCIETY.

Gold, Silver and Bronze Medals for the three best Dexter Cows competing in Classes 147 *and* 148.

Gold Medal.—A. C. KING, Braishfield Manor, Romsey, Hants, black, **La Mancha Madeline** (2272), born March, 1913.

Silver Medal.—LADY K. HARE, Brokenhurst Park, Brokenhurst, Hants, black, **Gort Peach 9th** (2496), born 10th February, 1913, bred by D. M. Rattray, Ballybunion, Co. Cork ; s Gort Fred 2nd (584), d Gort Peach (2235).

Bronze Medal.—MRS. NUTT, Hampton-in-Arden, Warwickshire, black, **Fillongley Favourite** (2242 Vol. xvi, p. 61).

BUTTER TEST.

(SEE REGULATION 64.)

(The Prizes in Class 149 were given by the English Jersey Cattle Society, and in Class 150 by the English Guernsey Cattle Society, and entries in them were subject to any conditions issued by these Societies previous to the tests).

CLASS 149.—*Cow, eligible for or entered in the English Jersey Herd Book, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Jersey Cattle Society.* [21 entries.]

Certificates of Merit were also awarded to Cows under 5 *years old obtaining* 30 *points, and to Cows* 5 *years old or over obtaining* 35 *points.*

I. (Gold Medal or £10.)—S. G. ASHER, Ascot Place, Ascot, whole Jersey, **Dainty,** born 14th January, 1914, bred by Mrs. Weston, Wokingham, Berks ; s Victor (11187), d Damson. (Last calf December 6, 1920).

II. (Silver Medal.)—G. BERRY, Withers, Mt. Bures, Bures, Suffolk, nearly whole, **Nimrod's Dinah 4th,** born 11th September, 1915, ; s Thorn's Aurelius 2nd, d Nimrod's Dinah 3rd, s d Postmaster. (Last calf January 1, 1921).

III. (Bronze Medal).—R. BRUCE WARD, Godington, Ashford, Kent, whole, **Ida,** born 15th March, 1915, bred by Major J. Baldwin, Alvechurch, Worcestershire ; s Antidote (10843), d Matilda, s d Marshall MacMahon (9695). (Last calf February 13, 1921).

Certificates of Merit.—MRS. EVELYN, Wotton House, Dorking, Surrey, whole, **Vervain's Bell** 3rd (Vol. xxv, p. 116), born 5th June, 1913, bred by A. W. Ruggles-Brise, Spain's Hall, Braintree, Essex ; s Midsummer (11064), d Vervain's Bell (Vol. xvi, p. 406), s d Chorister (6815). (Last calf January 9, 1921).—MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, whole, **Dockweed,** born 16th March, 1916, bred by — Thursby, Bramshaw, Lyndhurst, Hants ; s Marshall McMahon, d Dock. (Last calf March 19, 1921).—S. G. HOUGH, Springhouse Park, Theydon Bois, Essex, broken, **Nissa,** born 12th March, 1916, bred by H. Padwick, The Red House, West Ashling, Chichester ; s Topsy's Noble (10116), d Delia, s d Kummassa (7895).—(Last calf February 12, 1921).—MRS. RUDD, Felbridge Park Farm, East Grinstead, Sussex, whole,

Fire King's Tidy, born 2nd May, 1918 ; s Fire King, d Jolly Tidy, s d Cyclone 3rd. (Last calf December 26, 1920).—MRS. E. WATTS, Eastwood Park, Falfield, Glos., whole, **Duckwing** (Vol. xxiv, p. 291), born 30th August, 1910, bred by — Smith-Barry, Stowell Park, Wilts ; s Golden Swan (10260), d Daffodil, s d Groufille's Boy (6582). (Last calf March 29, 1921).—S. G. ASHER, whole, **Petunes Princess,** born 6th January, 1917, bred by F. J. Godel, St. Lawrence, Jersey ; s Anemone Leda's Lad, d Petunes Poppy. (Last calf April 14, 1921).—E. A. STRAUSS, M.P., Kingston House, Abingdon, Berks, whole, **Derry's Fairy,** born 16th May, 1916, bred by J. Barette, St. Brelade's, Jersey ; s Belinda's Golden Jolly (Vol. xxx), d Tombette Lady F.S.C. (10549). (Last calf March 18, 1921).—MRS. RUDD, whole, **So Lady Like,** born 22nd May, 1917, bred by F. Le Masurus, St. Brelade's, Jersey ; s Vale Lily's Lad, d So Late. (Last calf January 2, 1921).

CLASS 150.—*Cow, eligible for or entered in the English Guernsey Herd Book, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Guernsey Cattle Society.* [7 entries.]

I. (**£10.**)—G. F. FERRAND, Morland Hall, Alton, Hants, fawn and white, **Morland Diamond** (10847), born 21st July, 1914 ; s Chieftain of Hawkley (2238), d Rushington Shamrock 3rd (8243), s d Bonnie's Pride (1803).

II. (**£5.**)—G. F. FERRAND, dark fawn and white, **Fussey's Dora** (10036), born 21st July, 1912, bred by J. T. White, La Roussaillerie, Guernsey ; s Clairvoyante's Sequel (2279 P.S.), d Fussey (3688 F.S.). (Last calf March 2, 1921).

III. (**£3.**)—H.R.H. THE DUCHESS OF ALBANY, Claremont, Esher, Surrey, lemon and white, **Bosistow Marigold** (11154), born 27th February, 1915, bred by H. H. Laity, Porthcurnow, Cornwall ; s Godolphin Sambo (2450), d Olive Belle 1st (4813 P.S., R.G.A.S.), s d France's Masher 2nd (1102 P.S., R.G.A.S.), (Last calf April 1, 1921).

H.C.—MISS C. E. HAMBRO, The Lodge, Tadworth, Surrey, fawn and white, **Rosie 2nd of Quatrs Vents,** born 2nd June, bred by F. Netherton, Guernsey ; s Sailor Lad of the Fontaines, d Rosie of Quatrs Vents, s d Monarch of the Hougue. (Last calf December 24, 1920).

DAIRY HERDS

(The Prizes in Classes 151 to 153 were given by the Bristol Local Committee).

(The Animals entered in Classes 151 to 153 were judged on the farms to which they belong and were not exhibited in the Show Yard, and an Exhibitor in Class 151 or 152 could not also compete in Class 153).

CLASS 151.—*Herd of not less than 30 Dairy Cows, the property of a bona fide Yeoman or Tenant Farmer residing within 25 miles of the Guildhall, Bristol.* [3 entries.]

I. (**£30.**)—E. G. HARDING, Foxcote, Grittleton, Chippenham, Wilts.

II. (**£15.**)—WILLIAM BUTLER, Gatcombe Farm, Flax Bourton, Bristol

III. (**£10.**)—W. W. STEVENS, Manor Farm, Alderton, Chippenham, Wilts.

CLASS 152.—*Herd of over* 15 *and under* 30 *Dairy Cows, the property of a bona fide Yeoman or Tenant Farmer residing within* 25 *miles of the Guildhall, Bristol.* [2 entries.]

I. (**£20.**)—HENRY LEAR, Bottom's Farm, Doynton, near Bristol.

II. (**£15.**)—THOMAS MANSFIELD, Winterbourne Court, Winterbourne, Glos.

CLASS 153.—*Best Dairy Herd in the Counties of Gloucester or Somerset, the owner to be a member of a Ministry of Agriculture Milk Recording Association, points of judging to be settled by the Central Association of Milk Recording Societies.* [20 entries.]

I. (**£40.**)—CO-OPERATIVE WHOLESALE SOCIETY, LTD., Estate Office, Cherill, Calne.

II. (**£30.**)—W. R. WITHERS, Lower Court, Long Ashton, Bristol.

III. (**£20.**)—BEN. R. BROUGHTON, Manor Farm, North Perrott, Crewkerne.

IV. (**£10.**)—CHARLES HOWARD HARDING, Grittleton, Chippenham.

R.—J. WYATT, Mizzymead Farm, Nailsea, near Bristol.

H.C.—WILLIAM ARKELL, Manor Farm, Kempsford, Fairford.—J. F. BROUGHTON, Yeabridge, South Petherton.—T. KING, Lower Barnes Farm, Kingswood, Wotton-under-Edge, Glos.—F. W. MORLEY, Biddestone Manor, Chippenham, Wilts.—MRS. EDGAR WATTS, Eastwood Park, Falfield, Glos.—WHATLEY BROS., Burderop, Wroughton, Swindon.

C.—MAJOR R. F. FULLER, Great Chalfield, Melksham, Wilts.—HARRY GREEN, Tanyard Farm, Oakhill, Bath.—L. GRIFFIN, Manor Farm, Upton Cheyney, near Bristol.—SIR HENRY HOARE, BART., Stourhead, Zeals, Wilts.—A. T. S. LUCAS, Manor Farm, Cold Ashton, Marshfield, Chippenham.—T. G. VINCENT, Wraxall Farm, Shepton Mallet, Somerset.

SHEEP.

SHROPSHIRE.

(The First Prize in Class 154 was given by the Shropshire Sheep Breeders' Association).

CLASS 154.—*Shropshire Shearling Ram.* [2 entries.]

I. (**£10.**)—R. E. BIRCH, Maes Elwy, St. Asaph.

II. (**£5.**)—R. E. BIRCH.

CLASS 155.—*Pair of Shropshire Ram Lambs, dropped in* 1921. [2 entries.]

I. (**£10.**)—R. E. BIRCH, Maes Elwy, St. Asaph.

II. (**£5.**)—R. E. BIRCH.

CLASS 156.—*Pen of three Shropshire Shearling Ewes. First prize,* £10—*second,* £5—*third,* £2.

[NO ENTRY.]

DEVON LONGWOOLLED.

CLASS 157.—*Devon Longwoolled Shearling Ram.* [2 entries.]

I. (**£10.**)—F. WHITE, Torweston, Williton, Somerset.

II. (**£5.**)—F. WHITE.

CLASS 158.—*Pen of three Devon Longwoolled Shearling Ewes.* [2 entries.]

I. (**£10.**)—F. WHITE, Torweston, Williton, Somerset.

II. (**£5.**)—F. WHITE.

SOUTH DEVON.

(The First Prize in Class 159 was contributed by the South Devon Flock Book Association).

CLASS 159.—*South Devon Ram, other than Shearling. First prize* £10—*second,* £5—*third,* £2.

[NO ENTRY.]

CLASS 160.—*South Devon Shearling Ram.* [1 entry.]

I. (**£10.**)—H. WHITLEY, Primley, Paignton.

CLASS 161.—*Pen of three South Devon Shearling Ewes.* [2 entries.]

I. (**£10.**)—B. J. HOOPPELL, Folly, Bigbury, Kingsbridge, South Devon.

II. (**£5.**)—H. WHITLEY, Primley, Paignton.

KENT OR ROMNEY MARSH.

(The Prizes in Class 162 were given by the Kent or Romney Marsh Sheep Breeders' Association).

CLASS 162.—*Kent or Romney Marsh Two-Shear Ram.* [9 entries.]

I. (**£10.**)—J. E. QUESTED, The Firs, Cheriton, Kent.

II. (**£5.**)—L. H. AND G. W. FINN, Westwood Court, Faversham.

III. (**£2.**)—J. E. QUESTED.

R.—L. H. AND G. W. FINN.

H.C.—THE EARL OF GUILFORD, Waldershare Park, Dover.—THE HADLO FLOCK COMPANY, Somerhill Estate Office, Tonbridge.

CLASS 163.—*Kent or Romney Marsh Shearling Ram.* [15 entries.]

I. (**£10.**)—J. E. QUESTED, The Firs, Cheriton, Kent.
II. (**£5.**)—L. H. AND G. W. FINN, Westwood Court, Faversham.
III. (**£2.**)—O. C. MILLEN, Adisham Court, Canterbury.
R.—RIGHT HON. SIR A. MOND, Bart., Melchet Court, Romsey, Hampshire.
H.C.—L. H. AND G. W. FINN.—J. E. QUESTED.

CLASS 164.—*Pair of Kent or Romney Marsh Ram Lambs, dropped in* 1921. [8 entries.]

I. (**£10.**)—L. H. AND G. W. FINN, Westwood Court, Faversham.
II. (**£5.**)—THE EARL OF GUILFORD, Waldershare Park, Dover.
III. (**£2.**)—J. E. QUESTED, The Firs, Cheriton, Kent.
R.—L. H. AND G. W. FINN.
C.—RIGHT HON. SIR A. MOND, Bart., Melchet Court, Romsey, Hampshire.

CLASS 165.—*Pen of three Kent or Romney Marsh Shearling Ewes.* [8 entries.]

I. (**£10.**)—L. H. AND G. W. FINN, Westwood Court, Faversham.
II. (**£5.**)—L. H. AND G. W. FINN.
III. (**£2.**)—LIEUT.-COL. M. G. E. BELL, Bourne Park, Canterbury.
R.—J. E. QUESTED, The Firs, Cheriton, Kent.
H.C.—O. C. MILLEN, Adisham Court, Canterbury. —J. E. QUESTED.

SOUTHDOWN.

(The Prizes in Class 166 were given by the Southdown Sheep Society).

CLASS 166.—*Southdown Two Shear Ram.* [6 entries.]

I. (**£10.**)—THE LADY LUDLOW, Luton Hoo, Luton, Beds.
II. (**£5.**)—LADY FITZGERALD, Buckland, Faringdon, Berks.
III. (**£2.**)—R. S. HICKS, Wilbraham Temple, Cambs.
R.—THE LADY LUDLOW.

CLASS 167.—*Southdown Shearling Ram.* [10 entries.]

I. (**£10.**)—SIR J. COLMAN, Bart., Gatton Park, Surrey.
II. (**£5.**)—THE LADY LUDLOW, Luton Hoo, Luton, Beds.
III. (**£2.**)—LADY FITZGERALD, Buckland, Faringdon, Berks.
R.—SIR J. COLMAN, Bart.
H.C.—R. S. HICKS, Wilbraham Temple, Cambs.
C.—E. C. FAIRWEATHER, Avisford Park, Arundel.—R. S. HICKS.

CLASS 168.—*Pair of Southdown Ram Lambs, dropped in* 1921. [5 entries.]

I. (**£10.**)—SIR J. COLMAN, Bart., Gatton Park, Surrey.

II. (**£5.**)—LADY FITZGERALD, Buckland, Faringdon, Berks.

III. (**£2.**)—THE LADY LUDLOW, Luton Hoo, Luton, Beds.

R.—E. C. FAIRWEATHER, Avisford Park, Arundel.

SPECIAL PRIZE.

GIVEN BY THE SOUTHDOWN SHEEP SOCIETY, UNDER CONDITION 67.

Silver Medal or £1 *for the Best Ram or Ram Lamb in Classes* 166, 167 *and* 168.

I.—THE LADY LUDLOW, Luton Hoo, Luton, Beds.

R.—SIR J. COLMAN, Bart., Gatton Park, Surrey.

CLASS 169.—*Pen of three Southdown Shearling Ewes.* [4 entries.]

I. (**£10.**)—SIR J. COLMAN, Bart., Gatton Park, Surrey.

II. (**£5.**)—E. C. FAIRWEATHER, Avisford Park, Arundel.

III. (**£2.**)—THE LADY LUDLOW, Luton Hoo, Luton, Beds.

R.—R. S. HICKS, Wilbraham Temple, Cambs.

HAMPSHIRE DOWN.

(The Prizes in Class 171 and the Champion Prize were given by the Hampshire Down Sheep Breeders' Association).

CLASS 170.—*Hampshire Down Shearling Ram.* [9 entries.]

I. (**£10.**)—THE HON. LADY HULSE, Breamore House, Breamore, Hants.

II. (**£5.**)—MRS. JERVOISE, Herriard Park, Basingstoke.

III. (**£2**).—LORD WANDSWORTH AGRICULTURAL COLLEGE, Long Sutton, Basingstoke, Hants.

R.—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.

H.C.—MRS. JERVOISE.

C.—THE HON. LADY HULSE.—V. T. THOMPSON.

CLASS 171.—*Hampshire Down Ram Lamb, dropped in* 1921. [12 entries.]

I. (**£7.**)—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.

II. (**£5.**)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks.

III. (**£3.**)—V. T. THOMPSON,.

R.—The Lord Wandsworth Agricultural College, Long Sutton, Basingstoke.

H.C.—The Hon. Lady Hulse, Breamore House, Breamore, Hants.

C.—Mrs. Jervoise, Herriard Park, Basingstoke.—J. White, Foxhill Estate, Swindon, Wilts.

Class 172.—*Pair of Hampshire Down Ram Lambs, dropped in* 1921. [11 entries.]

I. (**£10.**)—Mrs. Jervoise, Herriard Park, Basingstoke.

II. (**£5.**)—The Hon. Lady Hulse, Breamore House, Breamore, Hants.

III. (**£2.**)—Major J. A. Morrison, D.S.O., Basildon Park, Goring, Reading, Berks.

R.—Lord Wandsworth Agricultural College, Long Sutton, Basingstoke, Hants.

H.C.—V. T. Thompson, Norton Manor, Sutton Scotney, Hants.

C.—Major J. A. Morrison, D.S.O.—J. White, Foxhill Estate, Swindon, Wilts.

CHAMPION PRIZE.

Given by the Hampshire Down Sheep Breeders' Association.

Best Pen of Lambs in Classes 171 *and* 172.

(Single Ram Lamb to constitute a Pen).

I. (**£5.**)—Mrs. Jervoise, Herriard Park, Basingstoke.

R.—V. T. Thompson, Norton Manor, Sutton Scotney, Hants.

Class 173.—*Pen of three Hampshire Down Shearling Ewes.* [4 entries.]

I. (**£10.**)—V. T. Thompson, Norton Manor, Sutton Scotney, Hants.

II. (**£5.**)—J. White, Foxhill Estate, Swindon, Wilts, bred by Sir G. Cooper, Bart., Hursley, Winchester.

III. (**£2.**)—Mrs. Jervoise, Herriard Park, Basingstoke.

R.—V. T. Thompson.

OXFORD DOWN.

Class 174.—*Oxford Down Shearling Ram.* [7 entries.]

I. (**£10.**)—H. W. Stilgoe, The Grounds, Adderbury, near Banbury, Oxon.

II. (**£5.**)—Captain R. B. Brassey, Heythrop, Chipping Norton.

III. (**£2.**)—Hon. F. G. Morgan, Dderw Farm, Llyswen, Breconshire.

R.—H. W. Stilgoe.

CLASS 175.—*Pair of Oxford Down Ram Lambs, dropped in* 1921. [7 entries.]

I. (£10.)—H. AKERS & Co., Black Banton, Clanfield, Oxon.

II. (£5.)—W. R. GANTLETT & SON, Manor Farm, Fairford, Glos.

III. (£2.)—H. AKERS & Co.

R. & H.C.—J. JOHNSTON, Cote House, Bampton, Oxon.

H.C.—CAPTAIN R. B. BRASSEY, Heythrop, Chipping Norton.

C.—MAJOR R. F. FULLER, Great Chalfield, Melksham, Wilts.—H. W. STILGOE The Grounds, Adderbury, near Banbury, Oxon.

CLASS 176.—*Pen of three Oxford Down Shearling Ewes.* [6 entries.]

I. (£10.)—CAPTAIN R. B. BRASSEY, Heythrop, Chipping Norton.

II. (£5.)—H. W. STILGOE, The Grounds, Adderbury, near Banbury, Oxon.

III. (£2.)—J. JOHNSTON, Cote House, Bampton, Oxon.

R. & C.—W. R. GANTLETT & SON, Manor Farm, Fairford, Glos.

(The Prizes in Class 177 were given by the Oxford Down Sheep Breeder's Association and were withheld until the Animals awarded the Prizes were registered in the Flock Books).

CLASS 177.—*Pair of Oxford Down Ewe Lambs, dropped in* 1921. [6 entries.]

I. (£6.)—J. JOHNSTON, Cote House, Bampton, Oxon.

II. (£3.)—H. W. STILGOE, The Grounds, Adderbury, near Banbury, Oxon.

III. (£1.)—H. AKERS & Co., Black Banton, Clanfield, Oxon.

R.—CAPTAIN R. B. BRASSEY, Heythrop, Chipping Norton.

C.—MAJOR R. F. FULLER, Great Chalfield, Melksham, Wilts.—W. R. GANTLETT & SON, Manor Farm, Fairford, Glos.

CLASS 178.—*Oxford Down Ram or Ram Lamb exhibited in Class* 174 *or* 175 *by a member of the Gloucestershire Agricultural Society. First prize,* £5—*second,* £2. [2 entries.]

[NO AWARD.]

CLASS 179.—*Oxford Down Shearling Ewe or Ewe Lamb, exhibited in Class* 176 *or* 177 *by a member of the Gloucestershire Agricultural Society. First prize,* £5—*second,* £2. [1 entry.]

[NO AWARD.]

DORSET HORN.

CLASS 180.—*Dorset Horn Shearling Ram.* [3 entries.]

I. (£10.)—A. A. BROUGHTON, Impens, North Petherton, Bridgwater.

II. (£5.)—F. J. MERSON & SON, North Petherton, Bridgwater.

III. (£2.)—F. J. MERSON & SON.

CLASS 181.—*Pair of Dorset Horn Ram Lambs, dropped after November 1st,* 1920. [3 entries.]

I. (£10.)—G. A. AND R. A. KINGSWELL, Wellow Farm, Yarmouth, Isle of Wight.

II. (£5.)—A. A. BROUGHTON, Impens, North Petherton, Bridgwater.

III. (£2.)—F. J. MERSON & SON, North Petherton, Bridgwater.

CLASS 182.—*Pen of three Dorset Horn Shearling Ewes.* [4 entries.]

I. (£10.)—B. R. BROUGHTON, Manor Farm, North Perrott, Crewkerne.

II. (£5.)—C. MORRIS, Lydeard Farm, Somerset.

III. (£2.)—B. R. BROUGHTON.

R. & H.C.—A. A. BROUGHTON, Impens, North Petherton, Bridgwater.

(The Prizes in Class 183 were given by the Dorset Horn Sheep Breeders' Association).

CLASS 183.—*Pen of three Dorset Horn Ewe Lambs, dropped after November 1st,* 1920. [3 entries.]

I. (£10.)—G. A. AND R. A. KINGSWELL, Wellow Farm, Yarmouth, Isle of Wight.

II. (£5.)—F. J. MERSON AND SON, North Petherton, Bridgwater.

III. (£2.)—C. MORRIS, Lydeard Farm, Somerset.

SPECIAL PRIZE.

Best Exhibit in Classes 180 *to* 183, *the property of a resident in Somerset.*

I. (£5.)—A. A. BROUGHTON, Impens, North Petherton, Bridgwater.

R.—B. R. BROUGHTON, Manor Farm, North Perrott, Crewkerne.

DORSET DOWN.

(The Prizes in Class 184 were given by the Dorset Down Sheep Breeders' Association).

CLASS 184.—*Dorset Down Shearling Ram.* [8 entries.]

I. (£10.)—P. AND C. SEWARD, Weston, Petersfield, Hants.

II. (£3.)—HOOPER BROS., Newburgh Farm, Winfrith, Dorset, bred by R N. Tory, Anderson, Dorset.

III. (£2.)—T. R. SPILLER, Luccombe Farm, Milton Abbas, Blandford.

H.C.—HOOPER BROS., bred by T. R. Spiller, Luccombe Farm, Blandford.

CLASS 185.—*Pair of Dorset Down Ram Lambs, dropped in* 1921. [10 entries.]

I. (**£10.**)—HOOPER BROS., Newburgh Farm, Winfrith, Dorset.

II. (**£5.**)—P. & C. SEWARD, Weston, Petersfield, Hants.

III. (**£2.**)—HOOPER BROS.

H.C.—R. R. MEAD, Volis, Taunton.

CLASS 186.—*Pen of three Dorset Down Shearling Ewes.* [5 entries.]

I. (**£10.**)—T. R. SPILLER, Luccombe Farm, Milton Abbas, Blandford.

II. (**£5.**)—P. & C. SEWARD, Weston, Petersfield, Hants.

III. (**£2.**)—HOOPER BROS., Newburgh Farm, Winfrith, Dorset.

H.C.—T. R. SPILLER.

C.—R. N. TORY, Anderson, Blandford, Dorset.

EXMOOR HORN.

(The First Prize in Class 187 was given by the Exmoor Horn Sheep Breeders' Society).

CLASS 187.—*Exmoor Horn Ram, two-shear and upwards.* [5 entries.]

I. (**£10.**)—J. HARRIS, Wistland Pound, Kentisbury, Barnstaple, bred by C. J. and O. Robins, Lydcott Hall, High Bray.

II. (**£5.**)—W. GAMMIN, The Barton, Simonsbath, Somerset, bred by W. G. Thorne, Higherhouse, Twitchen, South Molton, Devon.

III. (**£2.**)—J. AND O. ROBINS, Lydcott Hall, High Bray, bred by S. J. Westacott, Zeal, Hawkridge.

R.—W. H. ALEXANDER, Upavon House, Upavon, Pewsey, Wilts, bred by S. J. Westacott, Zeal, Hawkridge, Dulverton, Somerset.

V.H.C.—W. H. ALEXANDER, bred by T. Pring, Champion, Molland, Devon.

CLASS 188.—*Exmoor Horn Shearling Ram.* [2 entries.]

I. (**£10.**)—J. AND O. ROBINS, Lydcott Hall, High Bray, South Molton.

II. (**£5.**)—J. AND O. ROBINS.

CLASS 189.—*Pen of three Exmoor Horn Shearling Ewes.* [2 entries.]

I. (**£10.**)—J. AND O. ROBINS, Lydcott Hall, High Bray, South Molton.

II. (**£5.**)—J. HARRIS, Wistland Pound, Kentisbury, Barnstaple.

SPECIAL PRIZE.

Best Exhibit in Classes* 187 *to* 189, *the property of a resident in Somerset.

I. (**£5.**)—**W. GAMMIN, The Barton, Simonsbath, Somerset.**

SUFFOLK.

(£20 towards the Prizes in Classes 190 to 192 were offered by the President (Lord Bledisloe) and £25 by the Suffolk Sheep Society).

CLASS 190.—*Suffolk Shearling Ram. First prize,* £10—*second,* £5—*third,* £2. [1 entry.]

[NO AWARD]

CLASS 191.—*Pair of Suffolk Ram Lambs dropped in* 1921. [5 entries.]

I. (**£10.**)—Sir F. H. Bathurst, Bart., D.S.O., Somborne Park, Stockbridge, Hants.

II. (**£5.**)—H. C. Venning, Willet, Bicknoller, Taunton.

III. (**£2.**)—W. G. Buchanan, Manor House Farm, Abergavenny.

H.C.—H. C. Venning.

CLASS 192.—*Pen of three Suffolk Ewe Lambs, dropped in* 1921. [5 entries.]

I. (**£10.**)—Sir F. H. Bathurst, Bart., D.S.O., Somborne Park, Stockbridge, Hants.

II. (**£5.**)—W. G. Buchanan, Manor House Farm, Abergavenny.

III. (**£2.**)—H. C. Venning, Willet, Bicknoller, Taunton.

R.—H. C. Venning.

RYELAND

(£15 of the Prizes in Classes 193 to 195 were given by the Ryeland Sheep Society).

CLASS 193.—*Ryeland Shearling Ram.* [7 entries.]

I. (**£7.**)—J. Q. Rowett, Ely Place, Frant, Tunbridge Wells, bred by D. J. Thomas, Talachddu Farm, Brecon.

II. (**£4.**)—J. R. N. Waters, Fawke Farm, Sevenoaks, Kent.

III. (**£2.**)—T. L. Martin, Ashe Warren, Basingstoke. Hants.

R.—Friend & Renwick, The Weald, Sevenoaks, Kent.

C.—T. L. Martin.—J. Q. Rowett.— J. R. N. Waters.

CLASS 194.—*Pair of Ryeland Ram Lambs, dropped in* 1921. [5 entries.]

I. (**£7.**)—J. Q. Rowett, Ely Place, Frant, Tunbridge Wells.

II. (**£4.**)—T. L. Martin, Ashe Warren, Basingstoke, Hants.

III. (**£2.**)—T. L. Martin.

R.—Friend & Renwick, The Weald, Sevenoaks, Kent.

H.C.—J. R. N. Waters, Fawke Farm, Sevenoaks, Kent.

CLASS 195.—*Pen of Three Ryeland Shearling Ewes.* [5 entries.]

I. (**£7.**)—J. Q. ROWETT, Ely Place, Frant, Tunbridge Wells.

II. (**£4.**)—FRIEND & RENWICK, The Weald, Sevenoaks, Kent.

III. (**£2.**)—J. R. N. WATERS, Fawke Farm, Sevenoaks, Kent.

C.—LADY BLYTHSWOOD, Penrice Castle, Reynoldston, Glam, bred by Mrs. G. Holford, Buckland, Bwlch, Breconshire.

KERRY HILL.

(£15 of the prizes in Classes 196 to 198 were given by the Kerry Hill (Wales) Flock Book Society).

CLASS 196.—*Kerry Hill Ram, two-shear and upwards.* [1 entry.]

I. (**£7.**)—CAPTAIN J. M. NAYLOR, Leighton Hall, Welshpool, bred by T. E. Kinsey, Winsbury, Chirbury, Salop.

CLASS 197.—*Kerry Hill Shearling Ram. First prize, £7—second, £4—third, £2.* [1 entry.]

[NO AWARD.]

CLASS 198.—*Pen of three Kerry Hill Shearling Ewes.* [3 entries.]

I. (**£7.**)—CAPTAIN J. M. NAYLOR, Leighton Hall, Welshpool.

II. (**£4.**)—LADY BLYTHSWOOD, Penrice Castle, Reynoldston, Glam.

GOATS.

(£5 towards the Prizes in Classes 199 to 204 were given by the Countess Bathurst; £5 by the British Goat Society; £2 2s. each by Mrs. Reed Smith and Miss E. Skidmore; £1 by Miss Whitfield; 10s. 6d. by Miss Skidmore; 10s. by Mr. M. B. Bruce, and 5s. by Mr. R. Turner).

CLASS 199.—*Female Goat. Swiss, including Toggenburg, Anglo-Swiss, British Alpine, British Saanen or British Toggenburg, over two years.* [9 entries.]

I. (**£2 10s.**)—MISS E. SKIDMORE, Ashley Leigh, Box, Wilts, white, Swiss Saanen, **Basset's Cerese**, born 7th July, 1916, bred by Mrs. Lubbock, Bassets Farnborough, Kent; s Farnham Samson, d Bianca Theresa, s d Bricket Cain (E.S.).

II. (**£1 10s.**)—C. R. PAYNE, Pegglesworth, Andoversford, R.S.O., Glos., white, British Saanen, **Prudent of Bashley** (H.B. 3074), born 14th March, 1918, bred by Miss E. M. Pope, Bashley Lodge, New Milton; s Ch. Proud (H.B. 2853), d Prude Q* (H.B. 2501), s d Ch. Leazes Luck (H.B. 1754).

III. (**15s.**)—C. R. PAYNE, white, British Saanen (pure Swiss), **Firna** (H.B. 2452), born 19th March, 1914, bred by Mrs. Lubbock, Bassets, Farnborough, Kent; s Bricket Cain (H.B. 1573), d Furna (T. 215), s d † Sedgemere Garibaldi (T. 151).

R.—COUNTESS BATHURST, Cirencester Park, Cirencester, chocolate Anglo-Nubian-Swiss, **Ciceter Julia** (H.B. 3099), born 15th March, 1918; s Copthorne Brigadier (H.B. 2608), d Cirencester Favourite (H.B. 2266), s d Ch. Leazes Luck (1754).

CLASS 200.—*Female Goat. Anglo-Nubian and Any Other Variety not included in Class* 199, *over two years.* [6 entries.]

I. (**£2 10s.**)—MISS E. SKIDMORE, Ashley Leigh, Box, Wilts, red roan, Anglo-Nubian-Swiss, **Wigmore Clover**, born 31st May, 1913, bred by Miss Mortimer; s †Topaz, d Wigmore Cornflower**, s d Caper 10th.

II. (**£1 10s.**)—COUNTESS BATHURST, Cirencester Park, Cirencester, black, Anglo-Nubian-Swiss, **Ciceter Jonquil** (H.B. 3111), born 1st March, 1918; s Ciceter Highlander (H.B. 2603), d Cirencester Geranium, s d Champion Leazes Luck (1754).

III. (**15s.**)—MISS M. G. CULLEN, Westwood, Hewelsfield, St. Briavel's, Glos., dark chocolate, Anglo-Nubian-Swiss, **Keighley Patti** (H.B. 3358), born 1st July, 1918; s Ciceter Highlander (H.B. 2603), d Emanuel Nita, s d †Ballywalter Hawk (H.B. 2496).

R.—MISS M. L. C. HALLEN, The Court, Blagdon, near Bristol, Anglo-Swiss, **Luna**, born 1916, bred by Mrs. Perkins, Leeds.

V.H.C.—MISS E. SKIDMORE, brown (black points), Anglo-Nubian, **Edenbreck Tilda**, born 7th July, 1914, bred by W. H. Satterthwaite; s Clifton Trout (A.N. 651), d Wigmore Thistle (A.N.).

H.C.—A. DIGHTON, Whitchurch, Ross-on-Wye, red, Anglo-Nubian-Swiss, **Karmine**, born 1918, bred by Miss Burrow, Chithurst; s Wire Mile Thistle.

CLASS 201.—*Goatling. Any variety, over one year, but not exceeding two years.* [7 entries.]

I. (**£2 10s.**)—W. C. Heaton, Westwood, Hewelsfield, St. Briavel's, Glos., fawn, Anglo-Nubian-Swiss, **Emanuel Faerie** (H.B. 4038), born 22nd January, 1920; s Keighley Warrior (H.B. 3359), d Zoyland Bettie (H.B. 2874), s d Withdean Ajax (H.B. 2314).

II. (**£1 10s.**)—C. R. PAYNE, Pegglesworth, Andoversford, R.S.O., Glos., black, (white points), British Alpine, **Atherstone Perdita** (H.B.4242), born 19th February, 1920, bred by E. A. Walmis, The Priors' Farm, Mattingley Green, Winchfield, Hants; s †Tremedda Sir Galahad (H.B. 3139), d Prudent of Bashley (H.B. 3074), s d Ch. †Proud (H.B. 2853).

III. (**15s.**)—MISS E. SKIDMORE, Ashley Leigh, Box, Wilts, brown (white markings), Anglo-Swiss, **Heddon Amie**, born 29th March, 1920, bred by J. Morley, Box, Wilts; s Trimanton of Trenance, d Basset's Cerese, s d Farnham Samson.

R.—CAPTAIN T. DAVIES, Symond's Yat, Herefordshire, white, **Amwell Cordelia,** born 25th April, 1920, bred by Miss Chaplin, Crowborough, Sussex; s †Towcester Edwards, d Amwell Tassell, s d Ch. Broxbourne White Nugget.

V.H.C.—MISS E. SKIDMORE, red roan, Anglo-Nubian-Swiss, **Heddon Speedwell,** born 10th March, 1920, s Brendon Friday, d Wigmore Clover, s d †Topaz.

H.C.—MISS E. SKIDMORE, brown (white markings), **Feltham Silver Star,** born 14th April, 1920, bred by Mrs. Browell, The Vicarage, Old Feltham, Middlesex; s †Leazes Lucky Halton, d Ira Starry.

C.—R. TURNER, Saltford, Bristol, black and white, Anglo-Nubian-Swiss, **Saltford Pride** (H.B. 4493), born 30th May, 1920; s Ch. †Proud, d Coton Bay (P.R.), s d Harborough Cigar (A.N. 871).

CLASS 202.—*Female Kid. Any variety.* [7 entries.]

I. (**£2.**)—MISS M. G. CULLEN, Westwood, Hewelsfield, St. Briavel's Glos., grey fawn, Anglo-Nubian-Swiss, **Keighley Thora** (H.B. 4478, K.R. 8205), born 5th July, 1920, s †Tremedda Perceval (H.B. 3136), d Keighley Patti (H.B. 3358), s d Ciceter Highlander (H.B. 2603).

II. (**£1 10s.**)—C. R. PAYNE, Pegglesworth, Andoversford, R.S.O., Glos., white, British Saanen, **Cintra Prenda** (H.B.), born 7th February, 1921, s Ch. † Prophet of Bashley (H.B. 3775), d Prudent of Bashley (H.B. 3074), s d Ch. † Proud (H.B. 2853).

III. (**15s.**)—MISS M. G. CULLEN, chocolate (white markings), Anglo-Nubian-Swiss, **Keighley Treasure,** born 3rd January, 1921, s Zoyland Rupert (H.B. 3987), d Emanuel Nita, s d †Ballywalter Hawk.

R.—C. R. PAYNE, pale biscuit, British Saanen, **Cintra Pepita** (H.B.), born 7th February, 1921, s Ch. †Prophet of Bashley (H.B. 3775), d Prudent of Bashley (H.B. 3074), s d Ch. †Proud (H.B. 2853).

V.H.C.—A. DIGHTON, Tyn-yr-Noel, Whitchurch, Ross-on-Wye, red, Anglo-Nubian-Swiss, **Karminetta,** born 26th March, 1921, s Kolumbus, d Karmine, s d Wire Mile Thistle.

H.C.—MISS M. G. CULLEN, chocolate (white markings), Anglo-Nubian-Swiss, **Keighley Dot,** born 7th April, 1921, s †Ridgeway Rollo (H.B. 4061), d Keighley Patti (H.B. 3358), s d Ciceter Highlander (H.B. 2603).

CLASS 203.—*Male Goat. Any variety, over one year.* [9 entries.]

I. (**£2 10s.**)—COUNTESS BATHURST, Cirencester Park, Cirencester, brown, Anglo-Nubian-Swiss, **Ciceter Highlander** (H.B. 2603), born 4th April, 1916, s †Grange Granite (H.B. 2369), d Cirencester Favourite (H.B. 2266), s d Champion Leazes Luck (1754).

II. (**£1 10s.**)—R. TURNER, Saltford, Bristol, black and white, Anglo-Nubian-Swiss, †**Tremedda Sir Galahad** (H.B. 3139), born 16th March, 1918, bred by Miss A. Grossi, St. Ives, Cornwall; s †Oadby Emperor (H.B. 2004), d Tremedda Lalage* Q* (2522), s d †Wigmore Topaz (2040).

III. (**15s.**)—C. R. PAYNE, Pegglesworth, Andoversford R.S.O., Glos., black (white points), British Alpine, **Wayward of Westons** (H.B. 4354), born 9th April, 1920, bred by Miss Chamberlain, Westons, Lyndhurst, Hants; s †Edenstead Pluck (H.B. 3007). d Prelude of Bashley (H.B. 3073), s d Ch. † Proud (H.B. 2853).

R.—Miss E. Skidmore, Ashley Leight, Box, Wilts, white Anglo-Nubian-Swiss, **†Peter of Bashley**, born 19th March, 1920, bred by Miss Pope, E.M., Bashley Lodge, New Milton, Hunts.; s †Edenstead Pluck, d Promise of Bashley, s d † Proud of Bashley.

Class 204.—*Milking Competition for Goats. Any variety.* [12 entries.]

I. (£2 10s.)—Miss M. G. Cullen, Westwood, Hewelsfield, St. Briavel's, Glos., dark chocolate, Anglo-Nubian-Swiss, **Keighley Patti** (H.B. 3358), born 1st July, 1918, s Ciceter Highlander (H.B. 2603), d Emanuel Nita, s d †Ballywalter Hawk (H.B. 2496). (Last kid April 7, 1921).

II. (£1 10s.)—Miss E. Skidmore, Ashley Leigh, Box, Wilts, red roan, Anglo-Nubian-Swiss, **Wigmore Clover**, born 31st May, 1913, bred by Miss Mortimer; s †Topaz, d Wigmore Cornflower**, s d Caper 10th. (Last kid March 4.)

III. (15s.)—C. R. Payne, Pegglesworth, Andoversford, R.S.O., Glos., white, British Saanen, **Prudent of Bashley** (H.B. 3074), born 14th March, 1918, bred by Miss E. M. Pope, Bashley Lodge, New Milton; s Ch. †Proud (H.B. 2853), d Prude Q* (H.B. 2501), s d Ch. Leazes Luck (H.B. 1754). (Last kid February 7, 1921).

SPECIAL PRIZES.

Given by the British Goat Society.

For Animals entered in Classes 199 *to* 204:—

Challenge Certificate for the best Female Goat that has borne a kid.

I.—Miss E. Skidmore, Ashley Leigh, Box, Wilts, red roan, Anglo-Nubian-Swiss, **Wigmore Clover**, born 31st May, 1913, bred by Miss Mortimer; s †Topaz, d Wigmore Cornflower**, s d Caper 10th.

R.—Miss E. Skidmore, white, Swiss Saanen, **Basset's Cerese** born 7th July, 1916, bred by Mrs. Lubbock, Bassets, Farnborough, Kent; s Farnham Samson, d Bianca Theresa, s d Bricket Cain (E.S.).

Challenge Certificate for the best Dual Purpose Goat.

[No Award.]

Challenge Certificate for the best Male Goat over 1 year.

I.—Countess Bathurst, Cirencester Park, Cirencester, brown, Anglo-Nubian-Swiss, **Ciceter Highlander** (H.B. 2603), born 4th April, 1916, s †Grange Granite (H.B. 2369), d Cirencester Favourite (H.B. 2266), s d Champion Leazes Luck (1754).

R.—R. Turner, Saltford, Bristol, black and white, Anglo-Nubian-Swiss, **†Tremedda Sir Galahad** (H.B. 3139), born 16th March, 1918, bred by Miss A. Grossi, St. Ives, Cornwall; s †Oadby Emperor (H.B. 2004), d Tremedda Lalage* Q* (2522), s d *Wigmore Topaz (2040).

PIGS.

BERKSHIRE.

(£4 towards the Prizes in Classes 205 to 208 were given by the British Berkshire Society).

CLASS 205.—*Berkshire Boar, farrowed in* 1918, 1919 *or* 1920. [12 entries.]

I. (£7.)—W. H. PALMER, Stokes Farm, Wokingham, Berks, **Hammonds Hottentot** (21218), born 18th May, 1918, bred by H. R. Beeton, Checkenden, Oxon; s Hammonds Hyphen (19172), d Compton Giantess 2nd (19938), s d Iwerne John (18566).

II. (£3.)—J. NAGLE, Pamber Place, Charter Ley, Basingstoke, **Pamber Ugly Duckling** (22699), born 13th March, 1920, s Minley King (18364), d Jamaica Waac (20576), s d Moundsmere Warrior (17564).

III. (£2.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Basildon Mike**, born 28th January, 1920, s Murrell Mike (21239), d Pet (20124), s d Herriard Othello (17097).

R.—J. ISMAY, Iwerne Minster House, Blandford, **Highclere Hero** (21401), born 13th April, 1918, bred by the Earl of Carnarvon, Highclere; s Iwerne Hare Hill (19169), d Highclere Grace (19602), s d Highclere Postmaster (18414).

V.H.C.—J. NAGLE, **Pamber President** (22702), born 10th April, 1920, s Minley King (18364), d Compton Guest (20188), s d Manor Baronet (18978).

H.C.—LORD STALBRIDGE, Motcombe House, Shaftesbury, **Motcombe Premier** (24115), born 8th January, 1921, s Braishfield Buck (19909), d Minley Norah (18931), s d Minley Lad 2nd (18171).

C.—SIR J. BELL, Bellfield, Willerby, Hull, **Murrell Binks** (21237), born 2nd January, 1919, bred by — Palmer, Reading.—MRS. C. BEATTY, Calehill Park, Little Chart, Kent, **Murrell's Best** (20405), born 11th January, 1918, bred by H. Palmer, Wokingham; s Minley King (18364), d Minley Sunshine (18894), s d Suddon Jack (17327).

CLASS 206.—*Pair of Berkshire Boars, farrowed in* 1921. [8 entries.]

I. (£5.)—L. CURRIE, Minley Manor, Farnborough, Hants, born 10th January s Hammonds Hottentot (21218), d Murrell Namie (23260), s d Minley Lad (21235).

II. (£2.)—MRS. OAKES, Graslawn House, Exeter, born 11th January, s Octavious (23335), d Link's Jansey (19490), s d Kingston Marmaduke (18619).

III. (£1.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, born 21st January, s Murrell Mike (21239), d Iwerne Virtue (22096), s d Manor Pioneer (20004).

R.—LORD STALBRIDGF, Motcombe House, Shaftesbury, born 7th January, s Motcombe Premier (24115), d Motcombe Columbine (22255), s d Manor Masterman (20010).

V.H.C.—W. H. PALMER, Stokes Farm, Wokingham, Berks, born 4th January, s Hammond's Hottentot (21218), d Murrell Bride (23258), s d Minley Cossach (20634).

CLASS 207.—*Berkshire Breeding Sow, farrowed before* 1921. [13 entries.]

I. (**£7.**)—J. NAGLE, Pamber Place, Charter Ley, Basingstoke, **Pamber Prevoyant** (22701), born 13th March, 1920; s Minley King (18364), d Jamaica Waac (20576), s d Moundsmere Warrior (17564).

II. (**£3.**)—W. H. PALMER, Stoke's Farm, Wokingham, Berks, **Murrell Lassie** (19975), born 20th May, 1917; s Minley King (18364), d Murrell Lass (18935), s d Minley Champion (17122).

III. (**£2.**)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading Berks, **Iwerne Virtue** (22096), born 1st April, 1919, bred by J. H. Ismay, Iwerne Minster, Dorset; s Manor Pioneer (20004), d Nora Virtue (20108), s d Manor Daniel (19736).

R.—J. ISMAY, Iwerne Minster House, Blandford, **Compton Maggie** (22270), born 1st September, 1918, bred by R. B. Vincent, Waterston, Blandford; s Moundsmere Warrior (17564), d Compton Gloss (20186), s d Manor Baronet (18978).

V.H.C.—SIR J. BELL, Bellfield, Willerby, Hull, **Bellfield North**, born 3rd February, 1919, bred by T. Gibson, late Morton Flatts, Northallerton; s Whiteley Christopher (20391), d Hurrying North (20478), s d Hurry On (19635).

C.—MRS. C. BEATTY, Calehill Park, Little Chart, Kent, **Bright Daphiene** (20984), born 15th March, 1917, bred by F. Sheriff, Ascots, Hatfield, Herts., s Bright Boy (20096), d Ascots Adventure (20091), s d Chancellor 2nd. —LORD EBURY, North Farm, Sotwell, Wallingford, Berks, **Iwerne Megan** 3rd (21739), born 2nd September, 1921, bred by J. H. Ismay, Iwerne Minster, Blandford, s Hurry On (19635), d Iwerne Megan (19637), s d Iwerne Lad 2nd (18971).

CLASS 208.—*Pair of Berkshire Breeding Sows, farrowed in* 1921. [6 entries.]

I. (**£5.**)—LORD EBURY, North Farm, Sotwell, Wallingford, **Sotwell Megan 2nd** and **Sotwell Megan 3rd**, born 1st January; s Herriard Premier (21853), d Iwerne Megan 3rd (21739), s d Hurry On (19635).

II. (**£2.**)—L. CURRIE, Minley Manor, Farnborough, Hants, born 8th January; s Manor Clipper (22563), d Minley Delight 2nd (22309), s d Murrell Prince.

III. (**£1.**)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, born 8th January; s Hurry Onward (22033), d Basildon Marion (24519), s d Basildon Rob (20723).

R.—L. HARRISON & CO., LTD., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, born 5th January; s Jupiter (22316), d Manor Unity (20007), s d Top Emerald (19850).

V.H.C.—LORD EBURY, **Alice of Sotwell** and **Alice of Sotwell 2nd**, born 13th January, bred by Sir A. Herbert, Dunley Manor, Whitchurch, Hants; s Iwerne Monarch (23375), d Dunley Alice (21547), s d Moundsmere Warrior (17564).

SPECIAL PRIZE.

Given by the British Berkshire Society.

Best Boar or Sow in the Berkshire Classes entered in, or eligible for, the Herd Book, whose Sire and Dam, together with the name of its Breeder, are entered in the Catalogue.

I. (**£5.**)—W. H. Palmer, Stokes Farm, Wokingham, Berks, **Hammonds Hottentot** (21218), born 18th May, 1918, bred by H. R. Beeton, Chechenden, Oxon; s Hammonds Hyphen (19172), d Compton Giantess 2nd (19938), s d Iwerne John (18566).

R.—J. Nagle, Pamber Place, Charter Ley, Basingstoke, **Pamber Ugly Duckling** (22699), born 13th March, 1920; s Minley King (18364), d Jamaica Waac (20576), s d Moundsmere Warrior (17564).

LARGE BLACK.

(£40 towards the prizes in the Large Black Classes and the Champion Prizes were given by the Large Black Pig Society).

Class 209.—*Large Black Boar, farrowed before May 1st,* 1920. [12 entries.]

I. (**£7.**)—T. F. Hooley, Dry Drayton, near Cambridge, **Fentongollan Result** (9585), born 13th September, 1918, bred by W. L. Hosking & Sons, Fentongollan, Cornwall; s Treveglos Leader 3rd (6015), d Treveglos Smiling Lady 3rd (20850), s d Valley None Such (540).

II. (**£5.**)—L. Harrison & Co., Ltd., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, **Valley-up-to-Date** (9113), born 22nd March, 1918, bred by I. C. Olver, Woodlands Valley, Ladock, Cornwall; s Treveglos Marksman (7761), d Queen of the Valley 14th (19640), s d Valley Model (4971).

III. (**£2.**)—F. P. Brown, Kingston Farm, Chillerton, Isle of Wight, **Trevisquite Surprise** (9583), born 1st March, 1919, bred by T. Warne, St. Mabyn, Cornwall; s Tartar President (7617), d Trevisquite Levelsides 6th (19244), s d Boss of the Valley (3855).

R.—Lord Pirrie, K.P., Witley Park, Godalming, Surrey, **Witley Gay Lad** (11725), born 11th February, 1919; s Vahan Biddy's Boy (7013), d Vahan Dolly (16376), s d Trevisquite Vahan (4845).

C.—C. B. Gabriel, Coxhill, Chobham, Surrey, **Vahan Coxhill King** (9311), born 6th September, 1918, bred by S. F. Edge, Gallops Homestead, Ditchling, Sussex; s Vahan Melva 2nd (5691), d Vahan Queen 2nd (15514), s d Hasketon Lux 19th (3745).—W. J. Warren, Deacons, Staplegrove, Taunton, **Kibbear Chief** (14663), born 24th March, 1920; s Bassingbourne Squire (9053), d Kibbear Lady Amelia (24806), s d Alford Victor 2nd (6841).

Class 210. *Large Black Boar, not exceeding* 12 *months old on May* 1, 1921. [20 entries.]

I. (**£7.**)—J. H. Glover, Cornwood, South Devon, **Cornwood Marvel** (15831), born 10th May, 1920; s Fentongollan Naik (9455), d Cornwood Woodside (30140), s d Alfold Victor 2nd (6841).

II. (**£5.**)—H. C. Venning, Willett, Bicknoller, Taunton, **Willett Eclipse** (17693), born 1st July, 1920; s Willett Gammon (8521), d Willett Dimpsey (23062), s d Primley Helgarth (5765).

III. (**£2.**)—W. Bracey, Manor House, Martham, Great Yarmouth, **Martham Squire** (15271), born 22nd May, 1920; s Sudbourne Trigger (9353), d Bixley Bountiful 1st (34804), s d Swardeston That's Him (7347).

R.—H. E. Bastard, Tinten Manor, St. Tudye, Cornwall, **Tinten Challenger** (15561), born 10th June, 1920; s Trevisquite Padstonian (7973,) d Tinten Black Bess 19th (13698), s d Cornwood Councillor (3659).

H.C.—W. Bracey, **Martham What's Wanted** (15283), born 22nd May, 1920; s Sudbourne Trigger (9353), d Bixley Bountiful 1st (34804), s d Swardeston That's Him (7347).—A. D. Laurie, Homefield, Sevenoaks, Kent, **Maxwelltown Black Prince 9th** (15003), born 28th May, 1920; s Maxwelltown Black Prince 4th (11957), d Maxwelltown Lass 6th (24158), s d Maxwelltown Victor (8823).

C.—W. C. Warren, Farthing's Farm, Coneytrowe, Taunton, Somerset, **Kibbear Victor 3rd** (17583), born 17th August, 1920, bred by W. J. Warren, Deacon's, Staplegrove, Taunton; s Bassingbourne Squire (9053).; d Kibbear Lady Allies (17246), s d Drayton Disappointment.

CLASS 211.—*Large Black Boar, farrowed in* 1921. [20 entries.]

I. (**£7.**)—W. J. Warren, Deacons, Staplegrove, Taunton, **Kibbear Leader** (17581), born 3rd January; s Bassingbourne Squire (9053), d Kibbear Lady Amelia (24806), s d Alfold 2nd (6841).

II. (**£3.**)—F. P. Brown, Kingston Farm, Chillerton, Isle of Wight, **Kingston Duke** (17597), born 3rd January; s Trevisquite Surprise (9583), d Kingston Black Bess (26646), s d Drayton Kingston (6963).

III. (**£2.**)—W. Bracey, Manor House, Martham, Great Yarmouth, born 8th January; s Valley Good Boy (13733), d Docking Gold (35166), s d Loughtor Marvel (4437).

R.—H. E. Bastard, Tinten Manor, St. Tudye, Cornwall, **Tinten Victor 1st** (17481), born 4th January; s Fentongollan Lad (10567), d Tinten Black Bess 21st (17238), s d Boss of the Valley (3855).

V.H.C.—A. D. Laurie, Homefield, Sevenoaks, Kent, **Maxwelltoun Black Prince 17th** (17387), born 13th January; s Tinten King John 2nd (12489), d Maxwelltoun Souvenir 7th (39576).

H.C.—Miss Kay-Mouat, The Firs Farm, Malvern Wells, **McHeather Laird 11th**, born 5th January; s Sudbourne Masterpiece (13301), d McHeather Lassie 1st (18588),s d RatbyMorton Lad (6345).—The Pooley Hall Colliery Co., Ltd., Polesworth, Tamworth, born 23rd January; s Trevisquite Padstonian (7973), d Drayton Model 1st (33904), s d Drayton Moonlighter (8527).—W. Wills, Marlwood, Thornbury, Glos., **Lustleigh Spark**, born 14th January, s Swardsden Prince of Lustleigh (7787), d Cornwood Gordano 1st (22656), s d Loughtor Marvel (4437).

C.—W. H. J. Priest, Saltram Terrace, Plympton, South Devon, **Cornwood Excelsior** (17297), born 6th January, bred by J. H. Glover, Cornwood, South Devon; s Fentongollan Result (9585), d Cornwood Woodside (30140), s d Alfold Victor 2nd (6841).—C. C. Pyke, O.B.E., Capel Leyse, Holmwood, Surrey, **Holmwood Miller 3rd** (17331), born 2nd January; s Coolham Moonlighter (12205), d Bassingbourne Milly (23992), s d Bassingbourne Hero (7549).

CHAMPION PRIZE.

Best Animal in Classes 209 *to* 211.

I. (**£5.**)—J. H. GLOVER, Cornwood, South Devon, **Cornwood Marvel** (15831), born 10th May, 1920; s Fentongollan Naik (9455), d Cornwood Woodside (30140), s d Alfold Victor 2nd (6841).

R.—T. F. HOOLEY, Dry Drayton, near Cambridge, **Fentongollan Result** (9585), born 13th September, 1918, bred by W. L. Hosking & Sons, Fentongollan, Cornwall; s Treveglos Leader 3rd (6015), d Treveglos Smiling Lady 3rd (20850), s d Valley None Such (5401).

CLASS 212.—*Large Black Breeding Sow, farrowed before May* 1*st*, 1920. [19 entries.]

I. (**£7.**)—W. J. WARREN, Deacons, Staplegrove, Taunton, **Kibbear Lady Allies** (17246), born 6th May, 1916; s Drayton Disappointment 2nd (4573), d Kibbear Lady Annia (14050), s d Cornwood Magistrate (4271).

II. (**£5.**)—MISS KAY-MOUAT, The Firs Farm, Malvern Wells, **Heather Lass 1st** (23760), born 7th September, 1918; s Ratby Handyman 4th (7591), d McHeather Lassie 1st (18688), s d Ratby Morton Lad (6345).

III. (**£2.**)—W. BRACEY, Manor House, Martham, Great Yarmouth, **Bixley Springtime** (24840), born 18th July, 1917, bred by — Stimpson, Bixley, Norwich; s Brent Handyman (5423), d Swardeston Silky (17636), s d Tartar National Registration (5445).

R.—T. F. HOOLEY, Dry Drayton, near Cambridge, **Trevisquite Hatfield** (21234), born 8th August, 1917, bred by T. Warne, Trevisquite, St. Mabyn, Cornwall; s Boss of the Valley (3855), d Trevisquite Content 8th (13470) s d Treveglos Jockey (3811).

H.C.—T. MANSFIELD, Winterbourne Court, Winterbourne, Glos., **Treluckey Longlady** (17204), born 14th March, 1916, bred by T. F. James; s Valley Treveglos That's 'im (4579), d Trelucky Longsides (14060), s d Treludderow Pride of Lustleigh (4757).—A. PLAYLE, Bassingbourne, Cambs, **Bassingbourne Heather** (42086), born 2nd February, 1920; s Bassingbourne Masterpiece (6807), d Bassingbourne Countess 1st (20832), s d Cleave General (6367).

C.—S. F. EDGE, Gallops Homestead, Ditchling Hassocks, Sussex, **Vahan Hominy** (15524), born 15th February, 1915, s Valley Happy Boy (3515), d Hasketon Malthouse 6th (11386), s d Iford Dreadnought (3245).

CLASS 213.—*Large Black Breeding Sow, not exceeding* 12 *months old on May* 1*st*, 1921. [33 entries.]

I. (**£7.**)—T. F. HOOLEY, Dry Drayton, near Cambridge, **Drayton Margaret 4th** (50132), born 22nd June, 1920; s Fentongollan Naik (9455), d Witham Margaret 3rd (27714), s d Sudbourne Tiptree (7331).

II. (**£5.**)—F. P. BROWN, Kingston Farm, Chillerton, Isle of Wight, **Kingston Ladylike** (57230), born 4th June, 1920, s Trevisquite Surprise (9583), d Kingston Countess (27278), s d Drayton Kingston (6963).

III. (**£2.**)—A. D. LAURIE, Homefield, Sevenoaks, Kent **Maxwelltoun Lass 20th** (45558), born 28th May, 1920; s Maxwelltoun Black Prince 4th (11957), d Maxwelltoun Lass 6th (24158) s d Maxwelltoun Victor (8823).

R.—W. BRACEY, Manor House, Martham, Great Yarmouth, **Martham Sweep 2nd** (46766), born 2nd July, 1920; s Cleave Perfection (5801), d Sudbourne Martham Sweep (26982), s d Sudbourne Mate (6809).

V.H.C.—D. HILL, Claybrooke Grange, Lutterworth, **Claybrooke Bess 1st** (56752), born 6th May, 1920; s Vahan Goliath (0691), d Vahan Girlie (25770), s d Vahan Max (6993).

H.C.—H. E. BASTARD, Tinten Manor, St. Tudye, Cornwall, **Tinten Black Bess 37th** (48128), born 10th June, 1920; s Trevisquite Padstonian (7973), d Tinten Black Bess 19th (13698), s d Cornwood Councillor (3659).—W. BRACEY, Manor House, Martham, Great Yarmouth, **Martham Sweep 1st** (46764), born 2nd July, 1920; s Cleave Perfection (5801), d Sudbourne Martham Sweep (26982), s d Sudbourne Mate (6809).—H. G. A. GILES, Great Fancy, Crown Hill, near Plymouth, **Cornwood Czarina** (43006), born 10th May, 1920, bred by J. H. Glover, Cornwood, South Devon; s Fentongollan Naik (5613), d Cornwood Woodside (30140), s d Alfold Victor 2nd (6841).—THE POOLEY HALL COLLIERY CO., LTD., Polesworth, Tamworth, **Pooley Model** (56926), born 10th June, 1920; s Drayton Democrat (11613), d Drayton Model 1st (33904), s d Drayton Moonlighter (8527).—CAPTAIN A. G. SOAMES, O.B.E., Ashwell Manor, Penn, Bucks, **Ashwell Merrylass 1st** (41562), born 31st May, 1920; s Valley Merry Boy (7823), d Swardeston Missie 2nd (20264), s d Brent Handyman (5423).—J. WHITE, Foxhill Estate, Swindon, Wilts, **Wanborough Winsome 2nd** (57934), born 14th May, 1920; s Wanborough Waif (11419), d Wanborough Wench 2nd (32954), s d Loughtor Marvel (4437).

C.—J. G. DUGDALE, The Abbey, Cirencester, **Trelowtha's Duchess 6th** (51720), born 1st June, 1920, bred by W. Mitchell, Trelowthas, Probus, Cornwall; s Fentongollan Result (9585), d Trelowtha's Duchess 1st (44944), s d Cleave Fentongollan That's Him (5613).—J. G. DUGDALE, **Trelowtha's Duchess 7th** (51722), born 1st June, 1920, bred by W. Mitchell, Trelowthas, Probus, Cornwall; s Fentongollan Result (9585), d Trelowtha's Duchess 1st (44944), s d Cleave Fentongollan That's Him (5613).—W. L. HOSKING & SONS, Fentongollan, Probus, Cornwall, **Fentongollan Naomi** (44480), born 15th May, 1920; s Menna Dandy (7953), d Fentongollan Juanita 2nd (19250), s d Cleave Fentongollan That's Him (5613).

CLASS 214.—*Pair of Large Black Breeding Sows, farrowed in* 1921. [17 entries.]

I. (**£7.**)—T. F. HOOLEY, Dry Drayton, near Cambridge, born 25th January, s Winkingham Premier (11455), d Docking Queenie (24244), s d Cleave Perfection (5801).

II. (**£3.**)—J. H. GLOVER, Cornwood, South Devon, **Cornwood Lass 59th** (56136), and **Cornwood Lass 60th** (56138), born 6th January; s Fentongollan Result (9585), d Cornwood Woodside (30140), s d Alfold Victor 2nd (6841).

III. (**£2.**)—W. WILLS, Marlwood, Thornbury, Glos., **Lustleigh Marchioness 45th** and **46th**, born 16th January; s Cornwood Longsides (17443), d Lustleigh Marchioness 30th (25420), s d Swarsden Prince of Lustleigh (7787).

R.—W. BRACEY, Manor House, Martham, Great Yarmouth, born 8th January; s Valley Good Boy (13733), d Docking Gold (35166), s d Loughtor Marvel (4437).

H.C.—F. P. Brown, Kingston Farm, Chillerton, Isle of Wight, **Kingston Duchess** (57224) and **Kingston Daisy** (57226), born 3rd January; s Trevisquite Surprise (9583), d Kingston Black Bess (26646), s d Drayton Kingston (6963).—W. J. Warren, Deacon's, Staplegrove, Taunton, **Kibbear Lady Hilda 1st** and **2nd** (58232) and (58234), born 3rd January; s Bassingbourne Squire (9053), d Kibbear Lady Amelia (24806), s d Alfold Victor 2nd (6841).

C.—S. F. Edge, G Pops Homestead, Ditchling, Sussex, **Vahan Peony 1st** (56418) and **Vahan Peony 2nd** (56410), born 7th January; s Bassingbourne Raleigh Jumbo (7161), d Vahan Stowell Peony (36586), s d Vahan Marquis (5231).—T. Mansfield, Winterbourne Court, Winterbourne, Glos., **Springbourne Graceful 1st** and **2nd**, born 5th January; s Lustleigh Togo 2nd (12047), d Lustleigh Graceful 5th (34930), s d Swardeston Prince of Lustleigh (7787).—The Pooley Hall Colliery Co., Ltd., Polesworth, Tamworth, born 23rd January; s Trevisquite Padstonian (7973), d Drayton Model 1st (33904), s d Drayton Moonlighter (8527).—W. C. Warren, Farthing's Farm, Comeytrowe, Taunton, **Trull Dusky Queen 2nd** and **3rd** (58240) and (58242), born 5th January; s Bassingbourne Squire (9053), d Kibbear Lady Allies 2nd (24804), s d Alfold Victor 2nd (6841).

CHAMPION PRIZE.

Best Animal in Classes 212 *to* 214.

I. (£5.)—T. F. Hooley, Dry Drayton, near Cambridge, **Drayton Margaret 4th** (50132), born 22nd June, 1920; s Fentongollan Naik (9455), d Witham Margaret 3rd (27714), s d Sudbourne Tiptree (7331).

R.—W. J. Warren, Deacons, Staplegrove, Taunton, **Kibbear Lady Allies** (17246), born 6th May, 1916; s Drayton Disappointment 2nd (4573), d Kibbear Lady Annia (14050), s d Cornwood Magistrate (4271).

LARGE WHITE.

Class 215.—*Large White Boar, farrowed in* 1918, 1919 *or* 1920. [5 entries.]

I. (£7.)—The Earl of Ellesmere, Worsley Hall, near Manchester, **Stetchworth Turk 13th** (27275), born 14th February, 1918; s Stetchworth Tuck 4th (21345), d Belle of Caldmore (48932), s d Bourne Bandmaster 4th (18403).

II. (£3.)—R. P. Haynes, Delves Green Farm, Wednesbury, **Banner of Caldmore** (25897), born 7th January, 1919, bred by A. W. White, Spalding; s Banner of Spalding (21987), d Perfection of Spalding (50206), s d Jay of Wyburton.

III. (£2.)—W. White & Sons, Pool Farm, Taunton, Somerset, **Copped Hall Clansman** (23735), born 10th January, 1918, bred by E. J. Wythes, Copped Hall, Epping, Essex; s Walton Emperor (21459), d Copped Hall Clarissa (46642).

R.—F. W. Hickton, Brookfield Farm, Belbroughton, near Stourbridge, **Caldmore Kitchener 5th**, born 4th July, 1918; s Kitchener of Caldmore, d Histon Red Poppy 2nd, s d J.B. of Histon.

V.H.C.—T. H. Tilley, Manor Farm, Biddisham, Axbridge, Somerset, **Banner of Mendip** (25883), born 7th September, 1918, bred by A. W. White, Spalding, Linc.; s Banner of Spalding (21987), d Spalding Queen Mary 2nd (50502), s d Turk of Rayton (16393).

CLASS 216.—*Pair of Large White Boars, farrowed in* 1921. [6 entries.]

I. (£5.)—W. WHITE & SONS, Pool Farm, Taunton, Somerset, born 10th January; s Copped Hall Clansman (23735), d Copped Hall Barbara (53058).

II. (£2.)—LIEUT.-COL. SIR C. MILES, Bart., O.B.E., The Manor House, Walton-in-Gordano, Clevedon, **Gordano Guard 2nd** and **Gordano Guard 3rd** (Ear Nos. 8 and 9), born 19th January; s Histon Porter (Vol. xxxvii), d Dowager of Gordano (Vol. xxxvii), s d Worsley Turk 107th (Vol. xxxv, 8768).

III. (£1.)—L. HARRISON & CO., LTD., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, born 3rd January; s Nonsuch of Tockwith 2nd (27069), d Bushes Pride 5th, s d Bottesford Emperor 10th (19743).

R.—R. P. HAYNES, Delves Green Farm, Wednesbury, born 4th January, bred by the Whittingham Asylum Farm Committee, Preston; s Banner of Caldmore (25897), d Caldmore Amelia, s d Kitchener of Caldmore (22553).

H.C.—T. H. TILLEY, Manor Farm, Biddisham, Axbridge, Somerset, born 20th January; s Banner of Mendip (25883), d Mendip Countess 3rd (50070), s d Grantham Corporal (20013).

CHAMPION PRIZE.

GIVEN BY THE NATIONAL PIG BREEDERS' ASSOCIATION.

A Gold Medal, value £5, for the Best Boar in Class 215 *or* 216.

I.—THE EARL OF ELLESMERE, Worsley Hall, near Manchester, **Stetchworth Turk 13th** (27275), born 14th February, 1918; s Stetchworth Turk 4th (21345), d Belle of Caldmore (48932), s d Bourne Bandmaster 4th (18403).

CLASS 217.—*Large White Breeding Sow, farrowed before* 1921. [7 entries.]

I. (£7.)—THE EARL OF ELLESMERE, Worsley Hall, near Manchester, **Empress of Stetchworth 4th** (44274), born 3rd January, 1915, bred by D. R. Daybell, Bottesford, Nottingham; s Ringleader of Bottesford 2nd (17623), d Bottesford Empress 8th (37682), s d Mollington Jay of Bottesford (10965).

II. (£3.)—L. HARRISON & CO., LTD., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, **Bottesford Buttercup 13th** (52650), born 1st February, 1918, bred by D. R. Daybell, Bottesford, Nottingham; s Worsley Turk 95th (22971), d Bottesford Buttercup 4th (40638), s d Mollington Jay of Bottesford (10965).

III. (£2.)—R. P. HAYNES, Delves Green Farm, Wednesbury, **Caldmore Queenie** (58468), born 6th July, 1918; s Kitchener of Caldmore (22553), d Queen of Caldmore (44776), s d Caldmore Bass (17173).

V.H.C.—F. W. HICKTON, Brookfield Farm, Belbroughton, near Stourbridge, **Queen of Whittingham,** born 29th July, 1916, bred by A. W. White, Spalding; s Turk of Rayton, d Queen Mary, s d Stanwardine Jay.

CLASS 218.—*Pair of Large White Breeding Sows, farrowed in* 1921. [5 entries.]

I. (£5.)—W. WHITE & SONS, Pool Farm, Taunton, Somerset, born 10th January; s Copped Hall Clansman (23735), d Copped Hall Barbara (53058).

II. (**£2.**)—W. WHITE & SONS, born 12th January; s Copped Hall Clansman (23735), d Histon Lily 7th.

III. (**£1.**)—LIEUT.-COL. SIR C. MILES, Bart., O.B.E., The Manor House, Walton-in-Gordano, Clevedon, **Gordano Dowager 1st** and **Gordano Dowager 2nd** (Ear Nos. 10 and 11), born 19th January; s Histon Porter (Vol. xxxvii), d Dowager of Gordano (Vol. xxxvii), s d Worsley Turk 107th (Vol. xxxv, 8768).

R.—T. H. TILLEY, Manor Farm, Biddisham, Axbridge, Somerset, born 20th January; s Banner of Mendip (25883), d Mendip Countess 3rd (50070), s d Grantham Corporal (20013).

V.H.C.—L. HARRISON & CO., LTD., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, born 1st January; s Nonsuch of Tockwith 2nd (27069), d Bushes Pride 5th, s d Bottesford Emperor 10th (19743).

CHAMPION PRIZE.

GIVEN BY THE NATIONAL PIG BREEDERS' ASSOCIATION.

A Gold Medal, value £5, for the best Sow in Class 217 *or* 218.

I.—THE EARL OF ELLESMERE, Worsley Hall, near Manchester, **Empress of Stetchworth 4th** (44274), born 3rd January, 1915, bred by D. R. Daybell, Bottesford, Nottingham; s Ringleader of Bottesford 2nd (17623), d Bottesford Empress 8th (37682), s d Mollington Jay of Bottesford (10965).

MIDDLE WHITE.

CLASS 219.—*Middle White Boar, farrowed in* 1918, 1919 *or* 1920. [10 entries.]

I. (**£7.**)—L. HARRISON & CO., LTD., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, **Shipley Samson** (Vol. xxxvii), born 8th January, 1920; s Pendley King, d Histon Royal Lady (63104), s d Bookham of Harthay (19369)

II. (**£3.**)—LORD EBURY, North Farm, Sotwell, Wallingford, **Prestwood Acrobat 5th** (28227), born 1st January, 1919, bred by W. B. Hill, Vauxhall, Scotlands, Wolverhampton; s Prestwood Acrobat 1st (23197), d Prestwood Rosadora 1st (45806), s d Prestwood Bugler (14451).

III. (**£2.**)—MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, **Norsbury Virgel** (Vol. xxxvii), born 19th August, 1920; s Royalty of Norsbury (28275), d Norsbury Virtue (63292), s d Durbar of Histon (21679).

R.—W. R. PARTRIDGE, Woodmancote, Cirencester, **Ford Robert**, born 5th April, 1920, bred by Lieut.-Col. Spender-Clay, M.P., Ford Manor, Lingfield, Surrey; s Peene Rifleman, d Albany Lingfield, s d Shrewsbury of Albany.

V.H.C.—J. H. HOLLAND, Peene House, Newington, near Folkestone, **Peene Reveller 2nd**, born 28th June, 1919; s Boaz of Peene (25169), d Peene Peaceful (51732), s d Bardolf Warrior (19337).

CLASS 220.—*Pair of Middle White Boars, farrowed in* 1921 [12 entries.]

I. (£5.)—MAJOR ST. JOHN PIGOTT, Burningfold Farm, Dunsford, Surrey, **Burmingfold Hermes** and **Hermes 2nd**, born 20th January; s Hammond's Hermes (Vol. xxxvii), d Histon Welcome 8th (Vol. xxxvii), s d Histon Halo (25339).

II. (£2.)—DR. M. J. ROWLANDS, Nash Farm, Keston, Kent, born 8th January; s Keston Shrewsbury (28127), d Histon Lady 6th (63060).

III. (£1.)—W. T. B. CARTRIDGE, Sidbury, Worcester, born 3rd February; s Sidbury Alfonso (Vol. xxxvii), d Prestwood Graceless 2nd (Vol. xxxvii), s d Don of West Derby (20513).

R.—L. HARRISON & CO., LTD., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, born 3rd January; s Pendley King, d Shipley Pride 6th, s d Histon Shrewsbury 2nd (28081).

V.H.C.—BRIG.-GEN. B. ATKINSON, C.B., C.M.G., Mistley Hall, Manningtree Essex (Ear marks 1 and 2), born 4th January; s Wharfedale Delightful (28335), d Wharfedale Garland (57424), s d Hampton of Wharfedale (23077).

H.C.—S. F. EDGE, Gallops Homestead, Ditchling, Sussex, **Albany King Shrewsbury 5th** (1000) and **Albany King Shrewsbury 9th** (999), born 11th January; s Shrewsbury of Albany, d Albany Sunflower (51272), s d Wharfedale Surprise (20629).—LORD EBURY, North Farm, Sotwell, Wallingford, Berks, **Sotwell Acrobat** and **Sotwell Acrobat 6th**, born 2nd January; s Prestwood Acrobat 5th (28227), d Histon Prudence 4th (Vol. xxxvii), s d Bookham of Harthay (19369).

CHAMPION PRIZE.

GIVEN BY THE NATIONAL PIG BREEDERS' ASSOCIATION.

A Gold Medal, value £5, *for the best Boar in Class* 219 *or* 220.

I.—L. HARRISON & CO., LTD., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, **Shipley Samson** (Vol. xxxvii), born 8th January, 1920; s Pendley King, d Histon Royal Lady (63104), s d Bookham of Harthay (19369).

CLASS 221.—*Middle White Breeding Sow, farrowed before* 1921. [14 entries.]

I. (£7.)—J. H. HOLLAND, Peene House, Newington, near Folkestone, **Peene Beauty 2nd**, born 15th August, 1918; s Boaz of Peene (25169), d Peene Polly (57084), s d Peene Prince (21761).

II. (£3.)—SIR J. BELL, Bellfield, Willerby, Hull, **Midlothian Rose 6th**; born 3rd July, 1919, bred by Lord Rosebery, Dalmeny, Edinburgh; s Caldmore of Midlothian (25183), d Midlothian Rose (43058), s d Actor of Hatchfield (16693).

III. (£2).—L. HARRISON & CO., LTD., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, **Shipley Pride 6th** (Vol. xxxvii), born 29th May, 1919; s Histon Shrewsbury 2nd (20881), d Histon Pride 5th (63098), s d Bookham of Harthay (19369).

V.H.C.—Mrs. Hayes Sadler, Norsbury, Sutton Scotney, Hants, **Norsbury Crocus** (Vol. xxxvii), born 1st January, 1920 ; s Royalty of Norsbury (28275), d Histon Cupist (51518), s d Shrewsbury (19511).

H.C.—W. T. B. Cartridge, Sidbury, Worcester, **Fair Rosamond of Hammonds** (Vol. xxxvii), born 25th February, 1919, bred by Capt. Waring, Beenham House, Reading ; s Hope of Hammond's (25361), d Rose of Beenham (57282), s d Hammond's Moonbeam (21691).

Class 222.—*Pair of Middle White Breeding Sows, farrowed in* 1921. [13 entries.]

I. (**£5.**)—R. A. S. Mitchison, Pullington, Benenden, near Cranbrook, Kent, born 2nd January ; s Albany of Pullington 5th (Vol. xxxvii), d Horden Patricia, s d Sundon M.E.E.

II. (**£2.**)—Dr. M. J. Rowlands, Nash Farm, Keston, Kent, born 18th January ; s Albany Shrewsbury (25129), d Albany Millmaid (62384).

III. (**£1.**)—T. A. Stephens, Hookstile House, South Godstone, Surrey, **Hookstile Peach 2nd** and **3rd**, born 16th January ; s Baron of Hookstile (Vol. xxxvii), d Peene Peach.

R.—Brig.-Gen. B. Atkinson, C.B., C.M.G., Mistley Hall, Manningtree, Essex, **Mistley Posy** (Ear mark 3) and **Mistley Bouquet** (Ear mark 5), born 4th January ; s Wharfedale Delightful (28335), d Wharfedale Garland (57424), s d Hampton of Wharfedale (23077).

V.H.C.—L. Harrison & Co., Ltd., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, born 2nd January ; s Pendley King, d Histon Lady Gracious (63062), s d Shrewsbury (19511).

H.C.—Dr. M. J. Rowlands, born 8th January ; s Keston Shrewsbury (28127), d Histon Lady 6th (63060).

C.—S. F. Edge, Gallops Homestead, Ditchling, Sussex, **Albany Queen Lilac 1st** (1020) and **Albany Queen Lilac 2nd** (1022), born 21st January ; s Shrewsbury of Albany, d Albany Lilac (51236), s d Bookham Venture (21637).

CHAMPION PRIZE.

Given by the National Pig Breeders' Association.

A Gold Medal, value £5, *for the best Sow in Class* 221 *or* 222.

I.—J. H. Holland, Peene House, Newington, near Folkestone, **Peene Beauty 2nd,** born 15th August, 1918 ; s Boaz of Peene (25169), d Peene Polly (57084), s d Peene Prince (21761).

GLOUCESTERSHIRE OLD SPOTS.

(£100 towards the Prizes in Classes 223 to 231 and the Champion Prizes were given by the Gloucestershire Old Spot Pig Society).

Class 223.—*Gloucestershire Old Spots Boar, farrowed before January* 1*st*, 1920. [15 entries.]

I. (**£7.**)—T. King, Lower Barnes, Wotton-under-Edge, Glos., **Ithell's Major 2nd** (2084), born 16th November, 1919 ; s Gilslake Major (622), d Kitesnest Josephine (2613), s d Coleshill Bradley (240).

II. (£3.)—BENNETT & HOWARD, Quarry Farm, Thornbury, Glos., **Ashton Bloomer** (1741), born 23rd September, 1919, bred by University of Bristol Research Station, Long Ashton, Bristol; s Pegg's Bob (926), d Hobwell Blossom 2nd (2521), s d Woodland's King (68).

III. (£2.)—W. G. WILLIAMS, Coleshill Home Farm, near Highworth, Wilts, **Coleshill Wanderer 2nd**, born 15th November, 1918; s Watermoor Tom (454), d Portbury Emily 4th (355), s d Woodland's King (68).

V.H.C.—H. MATTHEWS, Down Farm, Winterbourne, near Bristol, **Oakleaze Edwin** (597), born 30th January, 1918, bred by A. T. Price, Blackhall, Berkeley, Glos, ; s Woodland's Julian (214), d Oakleaze Cora (540), s d Berkeley Jupiter (54).

H.C.—WEBBINGTON FARMS, LTD., Webbington, Axbridge, Somerset,—**Calkerton Clansman** (570), born October, 1917, bred by Exors. of G. Radcliffe, Taptor, Cirencester ; s Williamstrip King William 2nd (305).

C.—F. G. JONES, Church Farm, Mitcheltroy, Monmouth, **Birdlip Boss** (1675), Vol. vi), born 23rd August, 1919, bred by G. H. Willis, Ivy Lodge, Birdlip, Gloucester ; s Birdlip Spot (96), d Birdlip Judy (800), s d. Berkeley Champion (30).

CLASS 224.—*Gloucestershire Old Spots Boar, farrowed in* 1920, *before July* 1*st.* [14 entries.]

I. (£7.)—W. FROST, Almondsbury, near Bristol, **Gillslake Sportsman**, born 26th January, bred by J. H. Thomas, Cudleigh Court, Spetchley, Worcester ; s Clevehill Actor (Vol. v, 664), d Gillslake Duchess 3rd (Vol. v, 2539), s d Oakland's Hero (Vol. iv, 414).

II. (£3.)—H. C. BAKER, Oaklands, Almondsbury, Glos., **Ashton Conqueror** (25), born 10th March, bred by the University of Bristol Research Station, Long Ashton, Bristol; s Daglingworth Prince (1122), d Hobwell Duchess, s d Coleshill Monarch.

III. (£2.)—T. B. A. LAVER, Oakleaze, Berkeley, Glos., **Newport Aubrey,** born 29th May ; s Gilslake Major (622), d Oakleaze Eve (2421), s d Woodland's Julian (214).

R.—SIR J. ANDERSON, Bart., The Priory, Harrold, Beds, **Cleve Hill Togo,** born 7th January, bred by H. Bridgman, Downend, Bristol ; s Sultan of Hollywood Tower (461), d Cleve Hill Sarah (1548), s d Failand Hero (238).

H.C.—H. T. BEAK, Coln St. Denys, Fossbridge, Glos., **Fosse Lad,** born 3rd June; s Ashton Lad, d Sherborne Queen 7th, s d Berkeley Jester (80).—F. MOUNTFORD, Yew Tree Farm, Northfield, **Gilslake Fortune,** born 26th January, bred by J. H. Thomas, Spetchley, Worcester; s Clevehill Actor (664), d Gilslake Duchess 3rd (2539), s d Oakland's Hero (414).

CLASS 225.—*Gloucestershire Old Spots Boar, farrowed after June* 30*th,* 1920. [20 entries.]

I. (£6.)—J. H. THOMAS, Cudleigh Court, Spetchley, Worcester, **Gilslake Jumbo,** born 16th August; s Winterbourne Son, d Gilslake Duchess 3rd, s d Oaklands Hero.

II. (**£2.**)—WEBBINGTON FARMS, LTD., Webbington, Axbridge, Somerset, **Webbington Warrior,** born 6th July ; s Sultan of Hollywood Towers (461), d Gwent Amy (1551), s d Gilslake Duke (156).

III. (**£1.**)—F. H. REA, Kitesnest Farm, near Wotton-under-Edge, Glos., **Kitesnest Style** (Vol. vii), born 20th July ; s Ithell's Champion (2080), d Kitesnest Spot 2nd (6038), s d Failand Hero (238).

R.—H. MATTHEWS, Down Farm, Winterbourne, near Bristol, **Winterbourne Botha,** born 1st July ; s Winterbourne Hero (1517), d Almondsbury Nellie (6383), s d Chalfield Botha (816).

V.H.C.—R. A. BENNETT, and A. HOWARD, Quarry Farm, Thornbury, Glos., **Thornbury Hedgehog,** born 1st September ; s Clapcote Lictor (1861), d Thornbury Honeysuckle (5237), s d Battleborough Prince (627).

H.C.—J. D. BEAK, Maiden Bradley, Bath, **Maiden Bradley Champion,** born 1st July ; s Birdlip Victor, d Maiden Bradley Dolly, s d Bagborough Charm 3rd.

C.—UNIVERSITY OF BRISTOL RESEARCH STATION, Long Ashton, Bristol, **Ashton Colonel,** born 10th July ; s Daglingworth Prince (1122), d Hobwell Dolly (3089), s d Coleshill Monarch (464).—SIR W. G. WATSON, Bart., Sulhamstead House, Reading, **Sulhamstead Joe,** born 14th November ; s Gilslake President (856), d Sulhamstead Julia (5135), s d Berkeley Noble (445).—C. WITHERS, Stratton Farm, Clapton, Portishead, **Clapton Champion,** born 10th October ; s Coombe Commander 2nd (2162), d Clapton Lassie (4143).—THE EARL OF BERKELEY, Berkeley Castle, Glos., **Berkeley Genuine,** born 16th July, s Huntingford Major (2315), d Berkeley Jenny 8th (3379), s d Woodlands Julian.

CLASS 226.—*Two Gloucestershire Old Spots Boars, farrowed in* 1921. [24 entries.]

I. (**£7.**)—F. G. BELL, Huntingford Farm, Charfield, Glos., born 17th January ; s Hodgecombe Bradley (1366), d Huntingford Susie (6536), s d Kitesnest Jester (881).

II. (**£3.**)—R. C. WASHINGTON, Lovington, Castle Cary, Somerset, **Lovington Truepenny** and **Lovington Trump,** born 9th January ; s Dorset King (2105), d Dorset Gem (4722), s d Somerset Senor (501).

III. (**£2.**)—T. KING, Lower Barnes, Wotton-under-Edge, **Ithell's Major 6th** and **Ithell's Major 7th,** born 27th January ; s Ithell's Major 2nd (2084), d Ithell's Josephine 3rd (6555) ; s d Bradley King (910).

R.—H. FRANCIS & SONS, East Knoyle, Salisbury, **Dorset Lookout** and **Dorset Diver,** born 1st January ; s Clapcote Bob (373), d Gribton Jilt (1227), s d Kitesnest Recruiter (221).

V.H.C.—F. H. REA, Kitesnest Farm, near Wotton-under-Edge, Glos., born 30th January ; s Kitesnest Jester 2nd (Vol. vii), d Kitesnest Susan 6th (1107), s d Kitesnest Recruiter (221).—J. H. THOMAS, Cudleigh Court, Spetchley, Worcester, **Gilslake Recorder** and **Gilslake Banker,** born 9th February ; s Winterbourne Son, d Gilslake Duchess 3rd, s d Oaklands Hero.

C.—J. DOUGLAS, Hanham Road, Kingswood, Bristol, born 9th January ; s Ashton Bloomer, d Woodstock Alice.—E. T. GREY, Cowley Farm, King's

Weston, Bristol, born 15th March; s Ashton Bloomer (1741), d Clevehill Diana (Vol. vii), s d Sultan 4th of Hollywood Tower (461).—T. L. Martin, Ashe Warren House, Overton, Hants, **Warren Bloomer 1st** and **2nd**, born 21st January; s Ashton Bloomer (1741), d Patchway Maid (8055), s d Sultan 5th of Hollywood Tower (462).

SPECIAL PRIZE.

Best Boar exhibited in Classes 223 to 226 by a Member of the Gloucestershire Agricultural Society.

I. (**£5.**)—H. Matthews, Down Farm, Winterbourne, near Bristol, **Winterbourne Botha**, born 1st July; s Winterbourne Hero (1517), d Almondsbury Nellie (6383), s d Chalfield Botha (816).

Class 227.—*Gloucestershire Old Spots Breeding Sow, farrowed before* 1920. [22 entries.]

I. (**£10.**)—Sir J. Anderson, Bart., The Priory, Harrold, Beds, **Hobwell Blossom 2nd** (2521), born April, 1917, bred by H. B. Napier, Hobwell, Long Ashton, Bristol; s Woodlands King (68), d Hobwell Blossom 1st (2520), s d Winterbourne First Choice (5).

II. (**£5.**)—Earl of Leitrim, Court Lodge Farm, Teston, Maidstone, **Stanton Prior Kate 2nd** (5511, Vol. vi), born 26th July, 1919, bred by R. S. Tibbets, Stanton Priory, Bristol; s Walcombe Hero 2nd (385, Vol. v), d Chewton Princess 8th (2106), s d Winterborne Bark (482).

III. (**£2.**)—S. H. Badock, Holmwood, Westbury-on-Trym, Bristol, **Trym Valley**, born about March, 1917.

R.—R. J. Downing, Wintersell Farm, Edenbridge, Kent, **Lorridge Duchess 3rd** (1343), born 2nd March, 1917, bred by C. Bennett, Berkeley, Glos.; s Kitesnest Recruiter (221), d Lorridge Duchess, s d Rockhampton Dandy (56).

V.H.C.—G. Wilkins, Woodlands Grange, Almondsbury, Glos., **Patchway May** (2039), born 12th February, 1918; s Collingwood Jumbo (543), d Patchway Model (2038), s d Nutgrove Edward (92).

H.C.—Captain H. P. Hamilton, Breinton, Hereford, **Sporting Beauty** (1912), born May, 1917, bred by H. Savage, Alpha Cottage, Hatherley, Cheltenham.

C.—Bennett and Howard, Quarry Farm, Thornbury, Glos., **Thornbury Jane** (5808), born March, 1919, bred by W. Poole, Watchoak, Thornbury; s Battleborough Prince (627), d Watchoak Betty (4926).—J. H. Perrett, Hill House, Old Sodbury, Glos., **Hill House Gamble 1st** (4981), born 13th August, 1919; s Clevehill Actor (664), d Oaklands Mabel 5th (2076), s d Nutgrove Edward (92).—J. Roach, Arrow Farm, Bradley, Wotton-under-Edge, **Bradley Princess 2nd**, born 14th June, 1919; s Gilslake Champion, d Bradley Princess, s d Coleshill Bradley.—J. T. Withers, Fa' er Farm, Hambrook, **Cleve Hill Susan** (1547), born 4th August, 1917, bred by H. Bridgman, Cleeve Hill Farm, Downend; s Failand Hero (238), d Cleevehill Polly (775), s d Toddington Ben (33).

CLASS 228.—*Gloucestershire Old Spots Sow, farrowed in* 1920, *before July* 1*st.* [30 entries.]

I. (**£10.**)—J. W. WOOD, Staincross Hall, near Barnsley, **Dinedor Bountiful,** born 3rd January, bred by Captain Hamilton, Breinton, Hereford ; s Gilslake Major (622), d Sporting Beauty (1912).

II. (**£5.**)—W. J. COLE-MILLARD, Freezewood, Rudgway, near Bristol, **Freezewood Betsy,** born 23rd January ; s Clevehill Actor (664), d Freezewood Diana, s d Gilslake Star (179).

III. (**£2.**)—G. W. WESTON, Boldrewood, Lenham, Kent, **Haxted Bashful,** born 16th January ; s Gilslake Major (622), d Clevehill Rose (2721), s d Shipway Prince (284).

R.—R. J. DOWNING, Wintersell Farm, Edenbridge, Kent, **Lyndhurst Lizzie 2nd** (7621), born 18th January ; s Beckington Hero (999), d Thornbury Hellen (337), s d Berkeley Beau (21).

V.H.C.—W. G. WILLIAMS, Coleshill Home Farm, near Highworth, Wilts, **Coleshill Countess 25th,** born 18th February ; s Gilslake Marquis (1413), d Coleshill Countess (1373), s d Kitesnest Recruiter (221).

H.C.—MAJOR G. K. BURGE, Dent-de-Lion, Westgate-on-Sea, Thanet, **Thanet Alice 2nd,** born 11th May ; s Northaw Apollo 1st (842), d Northaw Alice 2nd (2507), s d Shenstone Boy (299).—P. W. CORY, Manor Farm, Notgrove, near Bourton-on-the-Water, Glos., **Rissington Perfection** (9475), born 29th January, bred by R. S. Bolter, Great Rissington, near Bourton-on-the-Water, Glos. ; s Croxten Fancy (802), d Rissington Lass (2929), s d Neston Newsman (160).—F. G. JONES, Church Farm, Mitcheltroy, Monmouth, **Wye Troy,** born 27th February, bred by A. R. Kirby, Fawley, Hereford ; s Stoke Covey Harry (1004), d Wye Perfect (1936), s d Chalfield General (237).—F. H. REA, Kitesnest Farm, Wotton-under-Edge, Glos., **Kitesnest Susan 9th,** born 30th March ; s Kitesnest Lad (2108), d Kitesnest Susan 6th (1107), s d Kitesnest Recruiter (221).

C.—P. W. CORY, **Grove Brownie 2nd,** born 15th May ; s Selby Baron 14th (1294), d Grove Brownie (6509), s d Berkeley Jules (448).—KAYE & CO., LTD., Southam, Rugby, **Southam Marguerite 3rd,** born 31st January ; s Gilslake Major (622), d Fawley Daisy (1688), s d Chalfield General (237).—KAYE & CO., LTD., **Southam Dolly 4th,** born 13th January ; s Gilslake Major (622), Fawley Dot (2009), s d Chalfield General (237). -J. ROACH, Arrow Farm, Bradley, Wotton-under-Edge, **Bradley Rose,** born 6th June ; s Hodgecombe Bradley, d Bradley Princess 2nd, s d Gilslake Champion.—J. H. THOMAS, Cudleigh Court, Spetchley, Worcester, **Bluebell,** born 5th January ; s Winterbourne Son, d Gilslake Duchess 2nd, s d Woodlands Jumbo.

CLASS 229.—*Two Gloucestershire Old Spots Sows or Hilts, farrowed after June 30th,* 1920. [12 entries.]

I. (**£8.**)—CAPTAIN H. P. HAMILTON, Breinton, Hereford, **Dinedor Brilliant** and **Dinedor Bloom,** born 2nd July, 1920 ; s Gilslake Major (622), d Sporting Beauty (1912).

II. (**£3.**)—J. DOUGLAS, Hanham Road, Kingswood, Bristol, **Woodstock Gertrude** and **Grace,** born 24th August, 1920 ; s Ithell's Hero, d Woodstock Alice, s d Shipway Prince.

III. (**£2.**)—F. SHEARMAN, Stoodleigh Court, Tiverton, **Stoodleigh Amy** and **Stoodleigh Ada,** born 5th July, 1920; s Gilslake President 2nd (1442), d Winterbourne Miss 2nd (4406), s d Ferndale Masterpiece (484).

R.—F. MOUNTFORD, Yew Tree Farm, Northfield, **Harborne Beauty** and **Harborne Queen,** born 8th August, 1920, bred by J. H. Thomas, Spetchley, Worcester; s Winterbourne Son (1196), d Gilslake Duchess 2nd, s d Woodlands Jumbo.

V.H.C.—WEBBINGTON FARMS, LTD., Webbington, Axbridge, Somerset, **Webbington Welcome** and **Watchful,** born 6th July, 1920; s Sultan of Hollywood Towers (461), d Gwent Amy (1551), s d Gilslake Duke (156).

C.—CAPTAIN H. P. HAMILTON, **Dinedor Beautitul** and **Dinedor Bella,** born 2nd July, 1920; s Gilslake Major (622), d Sporting Beauty (1912).—F. H. REA, Kitesnest Farm, near Wotton-under-Edge, Glos., **Kitesnest Jill** and **Kitesnest Jill 2nd,** born 27th July, 1920; s Ithell's Champion (2080), d Kitesnest Judy 2nd (717), s d Bradley Pride (132).

CLASS 230.—*Two Gloucestershire Old Spots Hilts, farrowed in* 1921. [17 entries.]

I. (**£10.**)—LORD SHERBORNE, Sherborne Park, Northleach, Glos., **Sherborne Jane** and **Sherborne Jane 2nd,** born 21st January; s Gilslake Major (622), d Woodstock Jane (4473), s d Shipway Prince (284).

II. (**£5.**)—J. H. THOMAS, Cudleigh Court, Spetchley, Worcester, **Gilslake Ideal** and **Margaret,** born 4th January; s Winterbourne Son, d Gilslake Dorcas, s d Gilslake Borderer.

III. (**£2.**)—T. L. MARTIN, Ashe Warren House, Overton, Hants, **Warren Empress 1st** and **2nd,** born 21st January; s Ashton Bloomer (1741), d Patchway Maid (8055), s d Sultan 5th of Hollywood Tower (462).

R.—G. WILKINS, Woodlands Grange, Almondsbury, Glos., **Patchway Midge** and **Patchway Meggie,** born 25th January; s Clevehill Actor (664), d Patchway May (2039), s d Collingwood Jumbo (543).

V.H.C.—F. G. JONES, Church Farm, Mitcheltroy, Monmouth, **Mitcheltroy Marvel** and **Mitcheltroy Marvellous,** born 1st March; s Birdlip Boss (1675), d Bounds Primrose 7th, s d Chalfield General (237).

H.C.—F. H. REA, Kitesnest Farm, near Wotton-under-Edge, Glos., born 30th January; s Kitesnest Jester 2nd (Vol. vii), d Kitesnest Susan 6th (1107), s d Kitesnest Recruiter (221).

CLASS 231.—*Gloucestershire Old Spots Sow, with litter (the latter not exceeding eight weeks old at time of exhibition).* [9 entries.]

I. (**£8.**)—A. W. BLACKER, Knighton Sutton Farm, Pensford, near Bristol, **Maiden Bradley Princess,** born January, 1919, bred by J. D. Beak, Maiden Bradley, near Bath; s Bagborough Charm 3rd (363), d Winterbourne Dame Drew (25).

II. (**£5.**)—P. W. CORY, Manor Farm, Notgrove, near Bourton-on-the-Water, Glos., **Rissington Primrose,** (9474), born 29th January, 1920, bred by R. S. Bolter, Great Rissington, near Bourton-on-the-Water, Glos. ; s Croxton Fancy (802), d Rissington Lass (2929), s d Neston Newsman (160).

III. (**£3.**)—H. C. BAKER, Oaklands, Almondsbury, **Hobwell Diana,** born 19th March, 1919, bred by H. B. Napier, Long Ashton, near Bristol ; s Nailsea Lad, d Hobwell Blossom 2nd.

IV. (**£1.**)—G. F. CULLIMORE, Mobley Farm, Berkeley, **Mobley Pride 8th** (5005). born 10th September, 1919, bred by H. S. Cullimore, Mobley, Berkeley ; s Mobley Jack (829), d Mobley Pride (1312), s d Woodlands Warrior 2nd (290).

R.—H. MATTHEWS, Down Farm, Winterbourne, Glos., **Almondsbury Greta** (6796), born 12th September, 1919, bred by W. Frost, Almondsbury, Glos. ; s Beckington King (994), d Almondsbury Grace 2nd (1706), s d Nutgrove Edward (92).

V.H.C.—S. H. BADOCK, Holmwood, Westbury-on-Trym, Bristol, **Trym Valley,** born about March, 1917.

SPECIAL PRIZE.

Best Sow, exhibited in Classes 227 to 231 by a Member of the Gloucestershire Agricultural Society.

I. (**£5.**)—H. MATTHEWS, Down Farm, Winterbourne, Glos., **Almondsbury Greta** (6796), born 12th September, 1919, bred by W. Frost, Almondsbury, Glos. ; s Beckington King (994), d Almondsbury Grace 2nd (1706), s d Nutgrove Edward (92).

GIVEN BY HENRY BRIDGMAN, ESQ., J.P., C.C.

To the Herdsmen whose exhibits won the greatest number of points, counting one point for commended, two for highly commended, and so additional upwards.

I. (**£3 3s.**)—J. H. THOMAS.

Equal II. (**£1 1s.**)—F. H. REA.

Equal II (**£1 1s.**)—T. KING.

GIVEN BY MRS. ELDRED WALKER.

To the Gloucestershire Old Spots Herdsman who kept his pens and exhibits in the cleanest and neatest condition throughout the Show.

I. (**£2 2s.**)—R. J. DOWNING,.

II. (**£1 1s.**)—WEBBINGTON FARMS, LTD.

R.—H. C. BAKER.

V.H.C.—J. DOUGLAS.

C.—BENNETT & HOWARD.—H. FRANCIS & SON.

CHAMPION PRIZES.

GIVEN BY THE GLOUCESTERSHIRE OLD SPOTS SOCIETY.

The Sir George Watson Challenge Cup, value £21, *for the best Animal in Classes* 223 *to* 231. *(The Cup to be won three times by the same Exhibitor with different animals before becoming his own property).*

I.—SIR J. ANDERSON, Bart., The Priory, Harrold, Beds, **Hobwell Blossom 2nd** (2521), born April, 1917, bred by H. B. Napier, Hobwell, Long Ashton, Bristol; s Woodlands King (68), d Hobwell Blossom 1st (2520), s d Winterbourne First Choice (5).

R.—W. FROST, Almondsbury, near Bristol, **Gillslake Sportsman,** born 26th January, bred by J. H. Thomas, Cudleigh Court, Spetchley, Worcester; s Clevehill Actor (Vol. v, 664), d Gillslake Duchess 3rd (Vol. v, 2539), s d Oakland's Hero (Vol. iv. 414).

The Deane-Drummond Cup, value £14 14*s., for the best Boar in Classes* 223 *to* 226.

I.—W. FROST, Almondsbury, near Bristol, **Gillslake Sportsman,** born 26th January, bred by J. H. Thomas, Cudleigh Court, Spetchley, Worcester; s Clevehill Actor (Vol. v, 664), d Gillslake Duchess 3rd (Vol. v, 2539), s d Oakland's Hero (Vol. iv, 414).

R.—T. KING, Lower Barnes, Wotton-under-Edge, Glos., **Ithell's Major 2nd** (2084), born 16th November, 1919; s Gilslake Major (622), d Kitesnest Josephine (2613), s d Coleshill Bradley (240).

The Hiatt-Baker Cup for the best Sow in Classes 227 *to* 231.

I.—SIR J. ANDERSON, Bart., The Priory, Harrold, Beds, **Hobwell Blossom 2nd** (2521), born April, 1917, bred by H. B. Napier, Hobwell, Long Ashton, Bristol; s Woodlands King (68), d Hobwell Blossom 1st (2520), s d Winterbourne First Choice (5).

R.—J. W. WOOD, Staincross Hall, near Barnsley, **Dinedor Bountiful,** born 3rd January, bred by Captain Hamilton, Breinton, Hereford; s Gilslake Major (622), d Sporting Beauty (1912).

(The "Deane-Drummond" and "Hiatt-Baker" Cups to be won twice by the same Exhibitor with different animals before becoming his own property).

GIVEN BY THE BRISTOL LOCAL COMMITTEE.

CLASS 232.—*Best Herd of Gloucestershire Old Spot Pigs, the herd to comprise of not less than five Breeding Sows and not less than two-*

thirds of the Herd to have been bred by the Exhibitor who must have been resident within 50 *miles of the Guildhall, Bristol.*

(The Animals entered in Class 232 were judged on the farm to which they belong and were not exhibited in the Show Yard).

I. (**£25.**)—J. Douglas, Hanham Road, Kingswood, Bristol.

II. (**£15.**)—H. C. Baker, Oaklands, Almondsbury, Glos.

III. (**£10.**)—Bennett & Howard, Quarry Farm, Thornbury.

R.—Henry Matthews, Down Farm, Winterbourne, near Bristol.

V.H.C.—Major R. F. Fuller, Great Chalfield, Melksham, Wilts.

H.C.—F. H. Rea, Kitesnest Farm, near Wotton-under-Edge.—W. G. Williams, Coleshill Home Farm, near Highworth, Wilts.

C.—E. C. Candy, Moors Farm, Holcombe, Bath.—Captain H. P. Hamilton, Breinton House, Hereford.

WESSEX SADDLEBACK.

(£30 towards the Prizes in Classes 233 to 238 and the Champion Prize were given by the Wessex Saddleback Pig Society).

Class 233.—*Wessex Saddleback Boar, farrowed in* 1919. [1 entry.]

I. (**£6.**)—S. White, Offley Grange, Hitchin, **Norman King Offa** (219), born 17th November, bred by W. Singer, Norman Court, Salisbury; s Norman Hero (27), d Norman Empress (45).

Class 234.—*Wessex Saddleback Boar, farrowed in* 1920. [7 entries.]

I. (**£6.**)—Right Hon. Sir A. Mond, Bart., Melchet Court, Romsey, Hampshire, **Melchet Donegal** (355, Vol. iii), born 9th July; s Cattistock Norman (6), d Norman Nitrate (321), s d Norman Hero (27).

II. (**£3.**)—Malden-Oakley Pig Herd Co., Polhampton Farm, Overton, Hants, **Oakley Beatty,** born 23rd January; s Cattistock Norman, d Sherfield Sister Susie.

III. (**£2.**)—Sir W. G. Watson, Bart., Sulhamstead House, Reading, **Ashe Hero 2nd** (420), born 6th August, bred by T. L. Martin, Ashe Warren, Basingstoke; s Caer Augustus Snodgrass (228), d Norman Node (318), s d Norman Hero (27).

R.—T. L. Martin, Ashe Warren House, Overton, Hants, **Forest Warrior** (295), born 5th May, bred by J. R. Burge, Titchfield, Fareham, Hants; s Rover of Forest (183), d Forest Warton (623), s d Saddleback Boar.

V.H.C.—Malden-Oakley Pig Herd Co., **Oakley Foch,** born 23rd January; d Sherfield Sister Susie.

H.C.—L. H. Withers, Kimbridge Manor Farm, Mottisfont, near Romsey, Hants, **King of Kimbridge** (436).

CLASS 235.—*Wessex Saddleback Boar, farrowed in* 1921. [12 entries.]

I. (**£5.**)—T. L. MARTIN, Ashe Warren House, Overton, Hants, **Ashe Monk,** born 2nd January; s Holbury Leader (188), d Norman Nunn (330).

II. (**£2.**)—T. L. MARTIN, **Ashe Plant 2nd,** born 29th January; s Ashe Plant (72), d Caer Girdle (438), s d Caer King Maker (9).

III. (**£1.**)—A. A. MILLARD, Pearash Farm, Penselwood, Bourton, Dorset, **Pearash Lennox,** born 28th February; s Norman Noble (101), d Pearash Lena 2nd, s d Cattistock Norman.

R.—T. OSMENT, Westleigh Farm, Lydeard St. Lawrence, Taunton, **Haydwood Custodian,** born 7th February; s Pearash Luthur, d Haydwood Ragtime Queen.

V.H.C.—SIR W. G. WATSON, Bart, Sulhamstead, Reading, **Kennet Simba,** born 7th January; s Eastington Simba (127), d Kennet Beauty 2nd (2203), s d Cattistock Nipper (7).

CLASS 236.—*Wessex Saddleback Breeding Sow, farrowed in* 1919. [2 entries.]

I. (**£6.**)—T. L. MARTIN, Ashe Warren House, Overton, Hants, **Norman Node** (318), born 23rd March, bred by W, M. G. Singer, Norman Court, Salisbury; s Norman Hero (27), d Norman Empress (45).

II. (**£3.**)—RIGHT HON. SIR A. MOND, Bart., Melchet Court, Romsey, Hampshire, **Norman Nitrate** (321), born 23rd March, bred by W. M. G. Singer, Norman Court, Salisbury; s Norman Hero (27), d Norman Empress (45).

CLASS 237.—*Wessex Saddleback Breeding Sow, farrowed in* 1920. [10 entries.]

I. (**£6.**)—S. WHITE, Offley Grange, Hitchin, **Offa Godiva** (1633), born 21st April, bred by L. S. Withers, Kimbridge, Romsey; s Rentpayer of Brighstone (149), d Beauty of Kimbridge (593).

II. (**£3.**)—RIGHT HON. SIR A. MOND, Bart, Melchet Court, Romsey, Hampshire, **Melchet Nitrate 2nd** (1209), born 9th July; s Cattistock Norman (6), d Norman Nitrate (321), s d Norman Hero (27).

III. (**£2.**)—G. R. SOUTHWELL, Holbury Farm, Lockerby, Romsey, **Egret** (1702), born 26th August, bred by E. Eeile, West Dean, Salisbury; s Norman Hero (27), d Black Sow.

V.H.C.—L. H. WITHERS, Kimbridge Manor Farm, Mottisfont, near Romsey, Hants, **Princess of Kimbridge** (1737); s Rentpayer of Brighstone (149), d Queen of Kimbridge (590), s d Duke of Brighstone (22).

H.C.—A. A. MILLARD, Pearash Farm, Penselwood, Bourton, Dorset, **Pearash Blinda 2nd,** born 1st September; s Norman Noble (101), d Pearash Blinda.

CLASS 238.—*Pair of Wessex Saddleback Breeding Sows, farrowed in* 1921. [8 entries.]

I. (**£5.**)—MAJOR J. F. HARRISON, Kingswalden Bury, Hitchin, **Kingswalden Sphinx** (2515), and **Kingswalden Cleopatra** (2516), born 1st January; s Norman Obelisk (300), d Norman Ottery (841).

II. (**£2.**)—SIR W. G. WATSON, Bart, Sulhamstead, Reading, **Kennet Dolly 10th** and **Kennet Dolly 11th**, born 3rd January; s Eastlington Simba (127), d Kennet Dolly 1st (469), s d Cattistock Norman (6).

III. (**£1.**)—T. L. MARTIN, Ashe Warren House, Overton, Hants, **Ashe Josephine 1st** and **2nd**, born 8th January; s Ashe Dad (374), d Ashe Violet (873), s d Ashe Snelgar (122).

R.—THE BRYN GARTH PIGGERIES, Bryn Garth, Hereford, **Dewhurst Mrs. Gamp** (2518, Vol. iv), and **Little Nell** (2519, Vol. iv), born 6th February; s Baron of Brighstone (111, Vol. ii), d Wye Ruby (551, Vol. ii).

V.H.C.—T. OSMENT, Westleigh Farm, Lydeard St. Lawrence, Taunton. **Haydwood Vegetarian 1st** and **2nd**, born 17th January; s Pearash Luthur, d Haydwood Beauty.

H.C.—MAJOR AND MRS. BATTEN, Aldon, Yeovil, **Aldon Marigold** and **Aldon Mignonette**, born 14th February; s Melchet Peter Pan, d Aldon Maria.

C.—SIR W. G. WATSON, Bart., **Kennett Beauty 9th** and **Kennet Beauty 10th**, born 7th January; s Eastlington Simba (127), d Kennet Beauty 2nd (2203) s d Cattistock Nipper (7).

GOLD MEDAL.

Value £5 5s. for the best Pig exhibited in Classes 233 to 238.

I.—S. WHITE, Offley Grange, Hitchin, **Norman King Offa** (219), born 17th November, bred by W. Singer, Norman Court, Salisbury; s Norman Hero (27), d Norman Empress (45).

R.—T. L. MARTIN, Ashe Warren House, Overton, Hants, **Norman Node** (318), born 23rd March, bred by W. M. G. Singer, Norman Court, Salisbury; s Norman Hero (27), d Norman Empress (45).

CHAMPION PRIZE.

GIVEN BY THE PRESIDENT (LORD BLEDISLOE).

A Silver Cup, value £30, for the best Boar in the Show of any Breed.

I.—J. H. GLOVER, Cornwood, South Devon, **Cornwood Marvel** (15831), born 10th May, 1920; s Fentongollan Naik (9455), d Cornwood Woodside (30140), s d Alfold Victor 2nd (6841).

R.—L. HARRISON & CO., LTD., Pedigree Live Stock Farms, Coolham, Horsham, Sussex, **Shipley Samson** (Vol. xxxvii), born 8th January, 1920; s Pendley King, d Histon Royal Lady (63104), s d Bookham of Harthay (19369).

PRODUCE.

CIDER.

(Open to Growers or Makers).

CLASS 239.—*Cask of not less than* 9 *and not more than* 30 *gallons of Cider, made in* 1920, *of a specific gravity not exceeding* 1.015 *at* 60° *Fahr.* [4 entries.]

I. (**£3.**)—PULLIN BROS.
II. (**£2.**)—J. M. PARRY & CO., LTD.
III (**£1.**)—H. J. DAVIS.

CLASS 240.—*Twelve bottles of Cider, made in* 1920, *of a specific gravity not exceeding* 1.015 *at* 60° *Fahr.* [6 entries.]

I. (**£3.**)—PULLIN BROS.
II. (**£2.**)—RIDLER & SON.
III. (**£1.**)—H. J. DAVIS.

CLASS 241.—*Cask of not less than* 9 *and not more than* 30 *gallons of Cider, made in* 1920. [7 entries.]

I. (**£3.**)—V. J. GAZZARD.
II. (**£2.**)—RIDLER & SON.
III. (**£1.**)—PULLIN BROS.

CLASS 242.—*Twelve bottles of Cider, made in* 1920. [7 entries.]

I. (**£3.**)—V. J. GAZZARD.
II. (**£2.**)—RIDLER & SON.
III. (**£1.**)—RIDLER & SON.
R.—H. J. DAVIS.
C.—PULLIN BROS.

CLASS 243.—*Twelve bottles of Cider, made in any year previous to* 1920. [11 entries.]

I. (**£3.**)—V. J. GAZZARD.
II. (**£2.**)—RIDLER & SON.
III. (**£1.**)—J. M. PARRY & CO., LTD.
H.C.—H. J. DAVIS.—H. J. DAVIS.—PULLIN BROS.
C.—RIDLER & SON.

CHEESE.

Class 244.—*Three Cheddar Chesses (not less than 56lbs. each), made in* 1920. [17 entries.]

I. (**£10.**)—E. J. Cary.
II. (**£7.**)—Miell Bros.
III. (**£4.**)—B. R. Broughton.
R.—J. Sage.
V.H.C.—Mrs. L. Whitting.
H.C.—J. C. Adlam.
C.—H. H. Sealy.

Class 245.—*Three Cheddar Cheeses (not over 56lbs. each) made in* 1920. [11 entries.]

I. (**£8.**)—A. Stone & Son.
II. (**£5.**)—E. A. King.
III. (**£3.**)—E. J. Cary.
V.H.C.—S. T. White.
H.C.—J. E. Hicks.
C.—H. Hill.

SPECIAL PRIZE.

(Open only to Residents in Somerset).

Best exhibit of Cheddar Cheese, not less than 50lbs. in weight.

I. (**£5.**)—E. J. Cary.
R.—B. R. Broughton.

(The Prizes in Classes 246 and 247 were given by the Somerset County Agricultural Instruction Committee).

Class 246.—*Three Cheddar Cheeses, not less than 56lbs. each, made by a Student who had attended the Somerset County Dairy Classes during the years* 1916–1921 *inclusive. First prize,* £8—*second,* £5—*third,* £3.

[No Entry.]

Class 247.—*Three Small Cheese, not exceeding 10lbs. each, made by a Student of the Somerset County Classes on Small Cheesemaking.* [14 entries.]

I. (**£5.**)—Mrs. S. Baker.
II. (**£3.**)—Miss M. Grabham.
III. (**£1.**)—Miss F. K. White.
R.—Miss R. M. Sparks.

CLASS 248.—*Three Single Gloucester or Wilts Cheeses, made in* 1920. [1 entry.]

II. (**£4.**)—H. LEAR.

CLASS 249.—*Eight Loaf or other Truckle Cheeses, made in* 1920. [10 entries.]

I. (**£5.**)—E. PADFIELD.
II. (**£3.**)—UNITED DAIRIES (WHOLESALE) LTD.
III. (**£2.**)—B. R. BROUGHTON.
R.—UNITED DAIRIES (WHOLESALE) LTD.

CLASS 250.—*Three Caerphilly Cheeses, made in* 1921. [18 entries.]

I. (**£5.**)—F. GRIST.
II. (**£3.**)—UNITED DAIRIES (WHOLESALE) LTD.
III. (**£2.**)—P. E. HUTCHINGS.
R.—UNITED DAIRIES (WHOLESALE) LTD.
H.C.—A. G. SAY.
C.—A. F. SOMERVILLE.

SPECIAL PRIZE.

(Open only to Residents in Somerset).

Best exhibit of three Caerphilly Cheeses.

I. (**£5.**)—F. GRIST.

CREAM CHEESE, BUTTER AND CREAM.

(These Classes were not open to Professional Teachers).

CLASS 251.—*Three Cream or other Soft Cheeses.* [12 entries.]

I. (**£3.**)—Miss K. WAYLEN.
II. (**£2.**)—BENNETT & HOWARD.
III. (**£1.**)—MRS. JOHNSON.
IV. (**10s.**)—W. R. GREENSHIELDS.

CLASS 252.—*2lbs. of Fresh (or very slightly salted) Butter.*—[34 entries.]

I. (**£4.**)—MRS. J. WAY.
II. (**£3.**)—MRS. L. R. MILDON.
III. (**£2.**)—MRS. W. H. PALMER.
IV. (**£1.**)—THE EARL OF MOUNT EDGCUMBE.

R. & V.H.C.—Miss B. E. Northcott.
V.H.C.—Mrs. M. Heywood.
H.C.—A. F. Somerville.
C.—Miss I. Northcott.

Class 253.—*2lbs. of Butter, in the making of which no salt had been used, judged on the last day of the Show.* [19 entries.]

I. (£4.)—Mrs. J. Way.
II. (£3.)—Mrs. W. H. Palmer.
III. (£2.)—Mrs. L. R. Mildon.
IV. (£1.)—The Earl of Mount Edgcumbe.
R.—Lt.-Col. D. F. Boles, C.B.E.
V.H.C.—Miss B. E. Northcott.
H.C.—Mrs. M. Heywood.
C.—A. F. Somerville.

(The Prizes in Class 254 were given by the Gloucestershire County Agricultural Education Committee).

Class 254.—*2lbs. of Butter made by a Gloucestershire County Council Dairy Student.* [11 entries.]

I. (£3.)—Miss M. A. Edwards.
II. (£2.)—Miss E. Budgett.
III. (£1.)—Miss L. Gallop.
IV. (10s.)—Miss L. Gabb.
R & V.H.C.—Miss D. P. Farr.
C.—Miss M. Meikle.

Class 255.—*12lbs. of Keeping Butter, in a jar or crock, delivered to the Secretary four weeks before the Show.* [8 entries.]

I. (£5.)—A. F. Somerville.
II. (£4.)—Mrs. A. A. Bere.
III. (£3.)—Mrs. L. R. Mildon.
IV. (£2.)—T. R. Bolitho.

Class 256.—*Four half-pounds of Scalded Cream.* [9 entries.]

I. (£3.)—Mrs. L. R. Mildon.
II. (£2.)—Mrs. J. Way.
III. (£1.)—Miss I. Northcott.
R & V.H.C.—Mrs. W. R. Beer.

COMPETITIONS.

BUTTER-MAKING.

(No Winner of a First Prize given by this Society for Butter-making during the last three years was eligible to compete in Class 257 or 259).

(The Prizes in Classes 258 and 260 were given by the Gloucestershire County Agricultural Education Committee and competition was confined to Gloucestershire County Council Dairy Students).

CLASS 257.—*For Men and Women, bona fide workers on a farm. On the 2nd day of the Show.* [20 entries.]

I. (**£4.**)—MISS E. JAMES.

II. (**£3.**)—MISS C. PANTALL.

III. (**£1 10s.**)—MISS E. M. PRICE.

IV. (**£1.**)—MISS E. HOLLOWAY.

R.—MISS H. PARSONS.

H.C.—MISS F. M. ECKLEY.—MISS J. A. EVERY.—MISS R. D. EVERY—MISS R. M. GWILLIM.—MISS A. M. GWYNNE.—MISS P. JONES.—MISS E. M. MORTIMER.—MISS E. PARKER.—MISS P. G. PASCOE.—MISS M. PHILLIPS.—MISS A. RUGMAN.—MISS A. M. SPENCER.—MRS. E. WATTS.—MISS N. L. WATTS.—MRS. W. WATTS.

CLASS 258.—*Novice Class. For Gloucestershire County Council Dairy Students who had not hitherto entered in a public Butter-making Competition. On the 2nd day of the Show.* [17 entries.]

I. (**£3.**)—MISS E. LEONARD.

II. (**£2.**)—MISS M. L. BRAIN.

III. (**£1.**)—MISS M. LEONARD.

IV. (**10s.**)—MISS G. B. BATLEY.

R.—MISS B. ALLAN.

H.C.—MISS A. SHIELD.

CLASS 259.—*For Students who had been through a course of instruction in Butter-making at any County Council School, and who had not previously won a first or second prize at one of the Society's Shows. On the 3rd day of the Show.* [20 entries.]

I. (**£4.**)—MISS H. PARSONS.

II. (**£3.**)—MISS R. D. EVERY.

III. (**£1 10s.**)—MISS J. A. EVERY.

IV. (**£1.**)—MRS. D. M. GAMMOND.

R.—MISS R. M. GWILLIM.

V.H.C.—MISS F. M. ECKLEY.

H.C.—MISS Z. FREEMAN.—MISS A. M. SPENCER.

CLASS 260.—*For Gloucestershire County Council Dairy Students, on the 3rd day of the Show.* [12 entries.]

I. (**£4.**)—MISS E. M. MORTIMER.
II. (**£3.**)—MISS E. A. HYATT.
III. (**£2.**)—MISS A. RUGMAN.
IV. (**£1.**)—MISS B. ALLAN.
R.—MISS M. A. SELVEY.
V.H.C.—MISS L. GABB.

CLASS 261.—*For Men and Women, on the 4th day of the Show.* [20 entries.]

I. (**£4.**)—MISS E. M. MORTIMER.
II. (**£3.**)—MRS. M. POOLEY.
III. (**£1 10s.**)—MRS. D. M. GAMMOND.
IV. (**£1.**)—MISS A. M. SPENCER.
R.—MISS A. M. GWYNNE.
V.H.C.—MISS H. PARSONS.
H.C.—MISS E. HOLLOWAY.
C.—MISS C. PANTALL.

CLASS 262.—*For Winners of First and Second Prizes in the Butter-making Classes* 257 *to* 261, *or at any previous meeting of the Society. On the* 5*th day of the Show.* [12 entries.]

I. (Gold Medal).—MISS E. JAMES.
II. (Silver Medal).—MISS C. PANTALL.
III. (Bronze Medal).—MISS R. JAMES.
R.—MISS R. D. EVERY.

MILKING.

(The First Prizes in Classes 263, 264 and 265 were given by the President, (Lord Bledisloe).

CLASS 263.—*For Men,* 16 *years of age and over.* [6 entries.]

I. (**£1 10s.**)—G. H. GEORGE.
II. (**£1.**)—E. HAWKINS.
III. (**15s.**)—W. W. MARSHALL.
IV. (**10s.**)—G. F. CRYER.

CLASS 264.—*For Women,* 16 *years of age and over.* [11 entries.]

I. (**£1 10s.**)—MISS G. NICHOLSON.
II. (**£1.**)—MISS R. D. EVERY.
III. (**15s.**)—MISS J. A. EVERY.
IV. (**10s.**)—MISS L. GABB.

CLASS 265.—*For Boys and Girls under* 16 *years of age.* [2 entries.]

I. (**£1 10s.**)—L. GEORGE.
II. (**£1.**)—C. BENNETT.

SHOEING.

(The Prizes in Classes 267 and 269 were given by the Somerset County Agricultural Instruction Committee and were open only to Students who had attended the Somerset County Council Farriery Classes since August 1st, 1919, and had not previously won a First Prize at any of the Society's Meetings or a Championship Prize at any National or County Agricultural Society's Show, and no mechanical aids, such as Bob-Punch, Platter, Guide Fuller, Wire Brush, etc., were allowed in making or fitting the shoes).

CLASS 266.—*For Cart Horse Shoeing, by Smiths not over 22 years of age on the day of Competition, who had not previously won the First Prize in a corresponding Class at one of the Society's Meetings, or a Championship Prize at any National or County Agricultural Society's Show, on the 2nd day of the Show.* [1 entry.]

II. (**£3.**)—L. BASTIN.

CLASS 267.—*Cart Horse Shoeing (Students' Class), ditto, ditto. On the 2nd day of the Show.* [1 entry.]

II. (**£2.**)—H. W. BURDEN.

CLASS 268.—*For Nag Horse Shoeing, by Smiths over 22 years of age on the day of Competition, who had not previously won the First Prize in a corresponding Class at one of the Society's Meetings, or a Championship Prize at any National or County Agricultural Society's Show, on the 3rd day of the Show.* [16 entries.]

I. (**£4.**)—J. C. PRICE, A.F.C.L.
II. (**£3.**)—J. HARRIS, A.F.C.L., R.S.S.
III. (**£2.**)—J. DAVIES, R.S.S.
IV. (**£1.**)—H. W. BURDEN.
R.—H. B. WELLAND.
V.H.C.—T. FELTHAM, A.F.C.L.
H.C.—D. L. JAMES.
C.—D. SAVERY.

CLASS 269.—*Nag Horse Shoeing (Students' Class), ditto, ditto. On the 3rd day of the Show.* [1 entry.]

I. (**£3.**)—H. W. BURDEN.

CLASS 270.—*For Shoe Making or Turning, by Smiths under 25 years of age on the day of the competition, the patterns and descriptions of the Shoes to be supplied by the Judge, on the 4th day of the Show.* [1 entry.]

II. (**£3.**)—L. BASTIN.

CLASS 271.—*For Shoe Making or Turning, by Smiths* 25 *years of age and over on the day of the competition, the patterns and descriptions of the Shoes to be supplied by the Judge, on the 4th day of the Show.* [14 entries.]

I. (**£4.**)—J. C. PRICE, A.F.C.L.

II. (**£3.**)—J. H. BAKER, Jun.

III. (**£2.**)—F. R. WHITEHORN, R.S.S.

IV. (**£1.**)—T. FELTHAM, A.F.C.L.

R.—J. L. MATHIAS, R.S.S.

V.H.C.—J. DAVIES, R.S.S.

H.C.—H. JONES.

C.—D. L. JAMES.

PRIZES FOR BEST MANAGED SMALL HOLDINGS AND BEST KEPT AND CULTIVATED ALLOTMENTS.

(The Prizes in Classes 1, 2 and 7 to 9 were given by the Bristol Local Committee; the First Prizes in Classes 3 and 4 by Lord Bledisloe, and the other Prizes in Classes 3 to 6 by County Subscriptions.)

SMALL HOLDINGS.

CLASS 1.—*Small Holding of over* 15 *acres and under* 50 *acres, situate in Gloucestershire or Somerset.* [2 entries.]

I. (**£15.**)—H. SYMES, Orchard Farm, Pilning, Bristol, "Orchard Farm," 24 acres.

II. (**£7.**)—B. STEPHENS, Watchett, Somerset, "Court Farm," 48 acres.

CLASS 2.—*Small Holding of over* 1 *acre and not more than* 15 *acres, situate in Gloucestershire or Somerset.* [1 entry.]

II. (**£5.**)—P. Y. SMITH, The Laurels, Parson Street, Bedminster, Bristol, "The Laurels," 10½ acres.

(Classes 3 to 6 were open only to Ex-Service men, tenants of their respective County Councils).

CLASS 3.—*Small Holding of over* 15 *and under* 50 *acres, situate in Gloucestershire.* [3 entries.]

I. (**£15.**)—H. SYMES, Orchard Farm, Pilning, Bristol, "Orchard Farm," 24 acres.

II. (**£7.**)—A. J. NEWMAN, Court Farm, Winterbourne, "Court Farm," 47 acres.

III. (**£3.**)—D. PEARCE, Whychwell Farm, Wapley, Chipping Sodbury, "Whychwell Farm," 31 acres.

Class 4.—*Small Holding of over* 1 *and not more than* 15 *acres, situate in Gloucestershire.* [7 entries.]

I. (**£10.**)—A. J. Kinchin, Mickleton, near Chipping Campden, "Abbot's Ground," 4 acres.

II. (**£5.**)—S. J. Righton, Mickleton, near Chipping Campden, "Abbot's Ground," 4 acres.

III. (**£2.**)—E. Chadband, Mickleton Campden, "Coles Land," 5 acres.

Class 5.—*Small Holding of over* 15 *and under* 50 *acres, situate in Somerset.* [10 entries.]

I. (**£15.**)—R. H. Shire, The Downs, Donyatt, near Ilminster "The Downs," 50 acres.

II. (**£7.**)—R. S. Bond, Dimer, Castle Cary, "Frank's House," 27 acres.

Equal **III.** (**£1 10s.**)—E. H. T. Vincent, Thrupe Farm, Masbury, Wells, "Thrupe Farm," 50 acres.

Equal **IV.** (**£1 10s.**)—R. W. Fowler, The Crossways, Crock Street, Ilminster, "The Crossways," 50 acres.

Class 6.—*Small Holding of over* 1 *and not more than* 15 *acres, situate in Somerset.* [1 entry.]

I. (**£10.**)—T. Gillingham, Court Farm, Seavington, Ilminster, "Park Court Farm," 8 acres.

Class 7.—*An exhibit of not less than* 4 *or more than* 6 *Varieties of Produce suitable for sale, grown on a Small Holding of less than* 15 *acres in Gloucestershire or Somerset, delivered in the Show Yard not later than* 6 *p.m. on Monday, May* 30*th. First prize,* £5—*second,* £3—*third,* £2.

[No Entry.]

ALLOTMENTS.

(Classes 8, 9 and 10 were open to Allotment Holders and Registered Societies, situate within 10 miles of the Guildhall, Bristol, subject to Condition 2).

Allotments entered in Classes 8 and 9 were first competed for "Allotment Estate" Prizes, and were judged under the supervision of the Bristol and District Small Holdings and Allotments Federation, Ltd. Entries were made to the Secretary of the Allotments Prize Scheme, c/o A.O.S. Offices, Carlton Chambers, Baldwin Street, Bristol, on or before March 31st, and prizes as mentioned above were awarded in each Allotment Estate. The Prize-winners must enter for the Champion Prizes.

Class 8.—*Allotment of not more than* 10 *Perches. First prize,* £2 10*s.*—*second,* £1.

1st Prizes.—H. E. Gridley, 22, Downend Road, Fishponds.—F. Purnell, 3, Victoria Park, Filton.—C. Willis, 19, Stackpool Road, Southville.—G. Parker, 17, Almviah Road, Bedminster.—F. J. Mundy, 51, Wish Street, Downend.—S. Good, Post Office, Hambrook.—R. Hallett, 25, Beau Street, Lower Ashley Road.—H. G. Pettitt, 138, Cromwell Road, St. Andrews.—C. Hallet, 9, Osborn Avenue, A. Down.—L. G. Stock, 9, Sandholm Road, Brislington.—A. Tanner, 4, Deanery Road, Warmley.—G. H. Harford, Goodeve Road, Sneyd Park.—B. Barnes, 25, Halsbury Road, Westbury Park.—A. J. Ricketts, 87, Vicarage Road, Whitehall.—C. W. Clarke, North Street, Oldland Common.—F. H. Perry, The Buildings, Pill.—J. T. Wall, 58, Bishop Road, Bishopston.—G. M. Elphick, 11, Pearl Street, Chessels, Bedminster.—T. Golding, 8, Queen Street, St. George.

2nd Prizes.—J. J. Wood, 11, Elmgrove Road, Fishponds.—P. Simister, 4, Homestead Road, Filton.—*H. J. Garland, 8, Westfield Place, Clifton.—*A. Perry, 28, Park Road, Southville.— —Hanks, 17, Almoriah Road, Bedminster.—F. G. Powell, 12, Maywood Road, Fishponds.—H. Garratt, The Street, Winterbourne.—J. S. A. Cook, 49, Stafford Road, Mina Road.—A. Childs, 158, Lower Cheltenham Place.—W. J. Matthews, 14, Beech Road, Horfield.—G. Rainbow, 5, Wishleigh Road, Knowle.—J. Gibbons, Tower Road, Warmley.—J. Taylor, Cheriton Place, Westbury-on-Trym.—A. Furze, 63, Berkeley Road, Westbury Park.—W. Hallett, 85, Bell Hill, St. George.—*J. Cording, 81, Vicarage Road, Whitehall.—*H. W. Pyke, 7, Ida Road, Whitehall.—G. Checketts, Heather House, Bitton.—E. E. Dickens, Myrtle Hill, Pill.—F. W. Harwood, 31, Monk Road, Bishopston.—F. T. Denman, 6, Reginald Crescent, Luckwell Road.

* Equal.

Class 9.—*Allotment of over* 10 *and not more than* 20 *Perches. First prize,* £2 10*s.*

1st Prizes.—C. Holbrook, 9, Mogg Street, Mina Road.—E. J. Baker, 3. Alexandra Buildings, Southmead, Filton.—W. H. Perry, 49, Hill Avenue, Victoria Park, Bedminster.—G. Bull, 8, Morley Road, Staple Hill.—F. C. Higgins, Frenchay, near Bristol.—G. Cummins, 5, Roman Road, Easton.—F. A. Gardener, 11, Hurlingham Road, A.Down.—F. L. Eames, 105, Sandy Park Road, Brislington: —A. Parslow, Made for ever Kingswood.—F. Weeks, 249, Henleaze Road, Westbury-on-Trym.—W. G. Sweeting, 57, Berkeley Road, Westbury Park.—F. Truett, 25, Cromwell Road, St. George.—H. J. Hancock, 23, Rudds Hill Road, St. George.—R. Short, North Street, Oldland Common.—T. Light, Easton in Gordano.—W. Bowden, 48, Bromley Road, Horfield.—T. W. Jones, 48, Luckwell Road, Bedminster.

CHAMPION PRIZES.

Best Allotment gaining a Prize in Class 8.

I. (**£5.**)—G. H. Harford.

Best Allotment gaining a Prize in Class 9.

I. (**£5.**)—A. Parslow.

Class 10.—*Best Managed Allotment Estate—Challenge Shield presented by Mr. Councillor Savory.* [11 entries.]

I. —Fishponds Allotments, Ltd. (F. E. Pepler, Secretary), 17, Elmgrove Road, Fishponds.

POULTRY.

(Under Poultry Club Rules).

(The Birds in Classes 1 to 49 must have been hatched previous to January 1st, 1921).

Class 1.—ANY PURE BREED, BEST MATED TO PRODUCE TABLE POULTRY—COCK AND THREE HENS, BRED IN 1919 OR 1920 (the Property of one Exhibitor. [11 entries.]

I. (**£3.**)—Northcott & Son, *Indian Game-Dark Dorkings.*

II. (**£2.**)—Templeman & Hall, *Indian Game.*

III. (**£1.**)—J. J. Baker & Son, *Indian Game.*

R.—Captain G. Phipps-Hornby, *Dorkings.*

V.H.C.—Morning Star Poultry Orchards, *Indian Game-Dark Dorkings.* —Major J. A. Morrison, D.S.O., *Indian Game-Red Sussex.*

H.C.—Miss I. King, *Rhode Island Red-Columbian Wyandottes.*

Class 2.—COCHIN OR BRAHMA, COCK. [8 entries.]

I. (**£1.**)—G. Lane, *Partridge Cochin.*

II. (**15s.**)—F. S. B. Sheppard, *Light Brahma.*

III. (**10s.**)—O. E. Hodge, *Buff Cochin.*

R.—G. Lane, *Partridge Cochin.*

V.H.C.—G. Lane, *Partridge Cochin.*—H. L. Popham, *Light Brahma.*—F. S. B. Sheppard, *Light Brahma.*

Class 3.—COCHIN OR BRAHMA, HEN. [4 entries.]

I. (**£1.**)—Lilleybrook Poultry Farm, *Light Brahma.*

III. (**10s.**)—R. P. Wheadon, *Dark Brahma.*

R.—D. Phillips, *Partridge Cochin.*

H.C.—H. L. Popham, *Light Brahma.*

Class 4.—PLYMOUTH ROCK, COCK. [7 entries.]

I. (**£1.**)—G. Tomkin.

II. (**15s.**)—H. Cooke.

III. (**10s.**)—R. J. Moore.

R.—R. J. Moore.

Class 5.—PLYMOUTH ROCK, HEN. [3 entries.]

II. (**15s.**)—H. Luke.

III. (**10s.**)—R. Roberts.

Class 6.—ORPINGTON (Buff), COCK. [6 entries.]

I. (**£1.**)—F. M. Rogers.
II. (**15s.**)—Major J. A. Morrison, D.S.O.
III. (**10s.**)—J. Hay.
R.—J. Barton-White.

Class 7.—ORPINGTON (Buff), HEN. [3 entries.]

I. (**£1.**)—Major J. A. Morrison, D.S.O.
III. (**10s.**)—W. T. Jefferies.
R.—F. M. Rogers.

Class 8.—ORPINGTON (Black), COCK. [13 entries.]

I. (**£1.**)—E. Windo.
II. (**15s.**)—S. R. Hooper.
III. (**10s.**)—W. Nation.
R.—Johns Bros.
V.H.C.—W. J. Pearce.—T. C. Pinniger.—J. Roberts.
H.C.—J. Harrington.—M. Lindner.—W. Nation.—C. J. Spinke.

Class 9.—ORPINGTON (Black), HEN. [7 entries.]

I. (**£1.**)—Johns Bros.
II. (**15s.**)—H. Corrie.
III. (**10s.**)—W. Nation.
R.—C. J. Spinke.
H.C.—W. H. Briffet.

Class 10.—ORPINGTON (White), COCK. [3 entries.]

I. (**£1.**)—M. Lindner.
II. (**15s.**)—W. Cory.
R.—H. Corrie.

Class 11.—ORPINGTON (White), HEN. [6 entries.]

I. (**£1.**)—H. Corrie.
II. (**15s.**)—M. Lindner.
III. (**10s.**)—W. Cory.
R.—M. Lindner.
H.C.—J. Harrington.

Class 12.—MINORCA, COCK. [7 entries.]

I. (**£1.**)—W. Bush.
II. (**15s.**)—W. M. Chapman.
III. (**10s.**)—G. Cleaves.
R.—Fursland Bros.
H.C.—A. G. Pitts.

Class 13.—MINORCA, HEN. [6 entries.]

I. (**£1.**)—Fursland Bros.
II. (**15s.**)—Fursland Bros.
III. (**10s.**)—G. Cleaves.
R.—A. G. Pitts.
H.C.—F. Godwin.

Class 14.—RHODE ISLAND (Red), COCK. [22 entries.]

I. (**£1.**)—J. J. Larcombe, R.C.
II. (**15s.**)—J. H. Baker & Son.
III. (**10s.**)—J. H. Evans.
R.—W. E. Dainton.

V.H.C.—J. J. Larcombe, S.C.—F. Mountford.—T. A. Scott & Co.—S. and E. Wilson.

H.C.—R. B. Astley.—Miss P. de L. Edwards.—A. J. Lucas.—F. Roberts.—R. Tory.—Wood & Bacon.

Class 15.—RHODE ISLAND (Red), HEN. [13 entries.]

I. (**£1.**)—T. A. Scott & Co.
II. (**15s.**)—H. J. Goddard.
III. (**10s.**)—F. Mountford.
R.—W. H. L. Hurman.
V.H.C.—A. J. Lucas.—R. Tory.—Mrs. G. Wheeler.—W. H. L. Hurman.
H.C.—A. J. Lucas.—S. and E. Wilson.

Class 16.—SUSSEX (Speckled), COCK. [6 entries.]

I. (**£1.**)—H. Blamey.
II. (**15s.**)—M. Lindner.
III. (**10s.**)—Captain G. Phipps-Hornby.
R.—F. A. Duck.
V.H.C.—W. Snell.
H.C.—Mrs. M. A. Grant.

CLASS 17.—SUSSEX (SPECKLED), HEN. [7 entries.]

I. **(£1.)**—L. H. WACE.
II. **(15s.)**—H. BLAMEY.
III. **(10s.)**—MRS. M. A. GRANT.
R.—M. LINDNER.
H.C.—CAPTAIN G. PHIPPS-HORNBY.

CLASS 18.—SUSSEX, (ANY OTHER COLOUR), COCK OR HEN. [12 entries.]

I. **(£1.)**—MRS. M. A. GRANT.
II. **(15s.)**—MAJOR J. A. MORRISON, D.S.O.
III. **(10s.)**—P. MARSH.
R.—A. J. FALKENSTEIN.
V.H.C.—A. J. FALKENSTEIN.—P. MARSH.—MAJOR J. A. MORRISON, D.S.O.
H.C.—W. A. GRAY.—MRS. L. M. KENWORTHY.—DR. J. E. SHAW.

CLASS 19.—DORKING (ANY VARIETY), COCK. [3 entries.]

I. **(£1.)**—A. C. MAJOR.
II. **(15s.)**—A. C. MAJOR.
R.—CAPTAIN G. PHIPPS-HORNBY.

CLASS 20.—DORKING (ANY VARIETY), HEN. [3 entries.]

I. **(£1.)**—A. C. MAJOR.
II. **(15s.)**—CAPTAIN G. PHIPPS-HORNBY.
R.—A. C. MAJOR.

CLASS 21.—FAVEROLLES, COCK OR HEN. [2 entries.]

I. **(£1.)**—R. E. J. BULL.
R.—G. TOMKIN.

CLASS 22.—LANGSHAM, COCK. [2 entries.]

I. **(£1.)**—PARK HOUSE POULTRY FARM, LTD.
R.—R. WOODFORD.

CLASS 23.—LANGSHAM, HEN—FIRST PRIZE, £1—SECOND, 15s.—THIRD, 10s.

[NO ENTRY.]

CLASS 24.—WYANDOTTE (SILVER OR GOLD LACED), COCK. [6 entries.]

I. **(£1.)**—R. W. WHITAKER, *Gold.*
II. **(15s.)**—S. KINGSBURY, *Gold.*
III. **(10s.)**—T. C. PINNIGER, *Gold.*
R.—J. RUNDLE.

CLASS 25.—WYANDOTTE (SILVER OR GOLD LACED), HEN. [6 entries.]

I. **(£1.)**—J. RUNDLE.

II. **(15s.)**—H. BROOM, *Gold.*

III. **(10s.)**—H. BROOM, *Gold.*

R.—T. C. PINNIGER, *Gold.*

CLASS 26.—WYANDOTTE (WHITE), COCK. [17 entries.]

I. **(£1.)**—W. CHUDLEY.

II. **(15s.)**—H. GUNN.

III. **(10s.)**—WOOD & BACON.

R.—T. A. SCOTT & CO.

V.H.C.—F. RODDA.

H.C.—H. BLAMEY.—LADY FITZGERALD.—MORNING STAR POULTRY ORCHARDS.

CLASS 27.—WYANDOTTE (WHITE), HEN. [19 entries.]

I. **(£1.)**—W. CORY.

II. **(15s.)**—H. GUNN.

III. **(10s.)**—H. BLAMEY.

R.—G. TOMKIN.

V.H.C.—LADY FITZGERALD.—D. PHILLIPS.

H.C.—F. MOUNTFORD.—T. A. SCOTT & CO.

CLASS 28.—WYANDOTTE (BLACK), COCK. [1 entry.]

I. **(£1.)**—W. W. THOMAS.

CLASS 29.—WYANDOTTE (BLACK), HEN. [4 entries.]

I. **(£1.)**—W. W. THOMAS.

II. **(15s.)**—W. W. THOMAS.

R.—REV. R. L. COLLINS.

CLASS 30.—WYANDOTTE (ANY OTHER COLOUR), COCK. [6 entries.]

I. **(£1.)**—S. J. SHEPHERD, *Columbian.*

II. **(15s.)**—J. MELLOR, *Partridge.*

III. **(10s.)**—MISS I. KING, *Columbian.*

R.—H. HUNT, *Columbian.*

CLASS 31.—WYANDOTTE (ANY OTHER COLOUR), HEN. [5 entries.]

I. **(£1.)**—MISS I. KING, *Columbian.*

II. **(15s.)**—LILLEYBROOK POULTRY FARM.

R.—S. J. SHEPHERD, *Columbian.*

CLASS 32.—LEGHORN (WHITE), COCK. [3 entries.]

II. (15s.)—MRS. G. WHEELER.
III. (10s.)—MISS J. E. M. BENTLEY.

CLASS 33.—LEGHORN (WHITE), HEN. [9 entries.]

I. (£1.)—F. ENGLAND.
II. (15s.)—F. REES.
III. (10s.)—F. REES.
R.—A. H. STANBURY.
H.C.—MAJOR G. MUNDY.

CLASS 34.—LEGHORN (ANY OTHER COLOUR), COCK. [4 entries.]

I. (£1.)—E. LL. SIMON, *Brown.*
II. (15s.)—J. JONES, *Brown.*
R.—J. JONES, *Brown.*

CLASS 35.—LEGHORN (ANY OTHER COLOUR), HEN. [3 entries.]

I. (£1.)—MAJOR J. A. MORRISON, D.S.O.
III. (10s.)—R. TORY.

CLASS 36.—HAMBURG (BLACK), COCK. [5 entries.]

I. (£1.)—H. FORTUNE.
II. (15s.)—R. P. INSALL.
R.—W. SNELL.

CLASS 37.—HAMBURG (BLACK), HEN. [7 entries.]

I. (£1.)—R. P. INSALL.
II. (15s.)—W. H. AVERY.
III. (10s.)—H. FORTUNE.
R.—R. W. WHITAKER.
V.H.C.—R. P. INSALL.
H.C.—D. W. LEWIS.

CLASS 38.—HAMBURG (ANY OTHER COLOUR), COCK. [1 entry.]

I. (£1.)—G. HARRIS.

CLASS 39.—HAMBURG (ANY OTHER COLOUR), HEN. [3 entries.]

I. (£1.)—W. H. AVERY.
II. (15s.)—G. HARRIS.
R.—W. SNELL.

CLASS 40.—OLD ENGLISH GAME (BLACK RED), COCK. [5 entries.]

I. **(£1.)**—G. THOMAS.
II. **(15s.)**—J. G. AND T. M. HARTLEY.
R.—W. H. HAMBLETON.
H.C.—H. DUNSTAN.

CLASS 41.—OLD ENGLISH GAME (BLACK RED), HEN. [3 entries.]

I. **(£1.)**—W. H. HAMBLETON.
II. **(15s.)**—J. G. AND T. HARTLEY.
R.—H. DUNSTAN.

CLASS 42.—OLD ENGLISH GAME (ANY OTHER COLOUR), COCK. [5 entries.]

I. **(£1.)**—MAJOR J. A. MORRISON, D.S.O.
II. **(15s.)**—J. G. AND T. HARTLEY.
R.—J. H. BAKER & SON.
V.H.C.—MAJOR J. A. MORRISON, D.S.O.

CLASS 43.—OLD ENGLISH GAME (ANY OTHER COLOUR), HEN. [4 entries.]

I. **(£1.)**—W. H. HAMBLETON.
II. **(15s.)**—J. G. AND T. HARTLEY.
R.—MAJOR J. A. MORRISON, D.S.O.

CLASS 44.—INDIAN GAME, COCK. [11 entries.]

I. **(£1.)**—E. C. TUCKER.
II. **(15s.)**—N. HARRIS.
III. **(10s.)**—N. H. REED.
R.—D. PHILLIPS.
V.H.C.—NORTHCOTT & SONS.
H.C.—H. HUNT.

CLASS 45.—INDIAN GAME, HEN. [10 entries.]

I. **(£1.)**—W. BRENT.
II. **(15s.)**—N. H. REED.
III. **(10s.)**—J. H. BAKER & SON.
R.—E. C. TUCKER.
V.H.C.—N. HARRIS.
H.C.—NORTHCOTT & SONS.

CLASS 46.—FRENCH (EXCLUDING FAVEROLLES), COCK. [2 entries.]

I. **(£1.)**—G. HENWOOD, *Creve.*
R.—G. HENWOOD, *La Fleche.*

CLASS 47.—FRENCH (EXCLUDING FAVEROLLES), HEN. [1 entry].

I. (£1.)—G. HENWOOD, *Creve.*

CLASS 48.—ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED, COCK. [17 entries.]

I. (£1.)—W. H. COOK, *Blue Orpington.*

II. (15s.)—J. H. BAKER & SON, *Malay.*

III. (10s.)—W. POWELL, *Old English Game Bantam.*

R.—H. HUNT, *Jubilee Game.*

V.H.C.—PARK HOUSE POULTRY FARM, LTD., *Russian Orloff.*—G. D. WAY, *Bantam.*—P. H. CRUMPLER, *Silver Campine.*

H.C.—DAVIES & GWYNNE, *Ancona.*—T. A. SCOTT & CO.—R. P. WHEADON, *Black Spanish.*

CLASS 49.—ANY OTHER DISTINCT BREED, NOT PREVIOUSLY MENTIONED, HEN. [17 entries.]

I. (£1.)—J. H. BAKER & SON, *Malay.*

II. (15s.)—H. HUNT, *Jubilee Game.*

III.—(10s.)—W. H. COOK, *Blue Orpington.*

R.—PARK HOUSE POULTRY FARM, LTD., *Russian Orloff.*

V.H.C.—T. A. SCOTT & CO.—G. D. WAY, *Bantam.*—R. P. WHEADON, *Black Spanish.*

H.C.—MAJOR J. A. MORRISON, D.S.O.—MRS. H. PHILLIPS, *Wyandotte Bantam.*—G. D. WAY, *Banta.*

SELLING CLASSES.

CLASS 50.—ANY DISTINCT BREED, COCK OR COCKEREL (PRICE NOT EXCEED £1 1s.) [9 entries.]

I. (£1.)—LADY FITZGERALD, *White Wyandotte.*

II. (15s.)—O. E. HODGE, *Rhode Island Red.*

III. (10s.)—MORNING STAR POULTRY ORCHARDS.

R.— —ORAM, *Black Minorca.*

V.H.C.—J. H. BAKER & SON, *Rhode Island Red.*—H. GUNN, *White Wyandotte.*

H.C.—MISS L. A. MARTIN, *Silver Wyandotte.*

CLASS 51.—ANY DISTINCT BREED, HEN OR PULLET (PRICE NOT TO EXCEED £1 1s.) [11 entries.]

I. (£1.)—E. MITCHELMORE, *Barred Rock.*

II. (15s.)—O. E. HODGE, *Rhode Island Red.*

III. (10s.)—R. W. WHITAKER, *Black Hamburgh.*

R.—W. NATION, *White Wyandotte.*

V.H.C.—G. NATION, *Minorca.*—NORTHCOTT & SONS.

H.C.—H. BROWN, *Black Minorca.*

CHICKENS OF 1921.

CLASS 52.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX OR DORKING—COCKEREL, HATCHED IN 1921. [13 entries.]

I. (**£1.**)—A. C. MAJOR, *Dorking*, hatched January 2.

II. (**15s.**)—PARK HOUSE POULTRY FARM, LTD., *Light Sussex*, hatched January 6.

III. (**10s.**)—F. J. THOMAS, *White Plymouth Rock*, hatched January 4.

R.—MAJOR J. A. MORRISON, D.S.O., *Sussex*, hatched January 3.

V.H.C.—S. R. HOOPER, *Black Orpington*, hatched February 17.—JOANS BROS., *Black Orpington*, hatched January 3.—MAJOR J. A. MORRISON, D.S.O., *Sussex*, hatched January 3.

H.C.—MAJOR J. A. MORRISON, D.S.O., *Orpington.*

CLASS 53.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX, OR DORKING - PULLET, HATCHED IN 1921. [14 entries.]

I. (**£1.**)—A. C. MAJOR, *Dorking*, hatched January 2.

II. (**15s.**)—A. J. FALKENSTEIN, *Sussex*, hatched January 2.

III. (**10s.**)—MISS D. M. BODEN, *Light Sussex*, hatched January 1.

R.—S. R. HOOPER, *Black Orpington*, hatched February 17.

V.H.C.—MAJOR J. A. MORRISON. D.S.O., *Sussex*, hatched January 3.—MAJOR J. A. MORRISON, D.S.O., *Orpington*, hatched January 3.—PARK HOUSE POULTRY FARM, LTD., *Light Sussex*, hatched January 6.

H.C.—MRS. A. CAVILL, *Croad Langsham*, hatched February 3.—MAJOR J. A. MORRISON, D.S.O., *Sussex*, hatched January 3.—F. J. THOMAS, *White Plymouth Rock*, hatched February 12.

CLASS 54.—MINORCA, WYANDOTTE, LEGHORN, HAMBURG, FAVEROLLES OR FRENCH--COCKEREL, HATCHED IN 1921. [12 entries.]

I. (**£1.**)—W. H. COOK, *White Wyandotte*, hatched January 2.

II. (**15s.**)—H. GUNN. *White Wyandotte*, hatched January 1.

III. (**10s.**)—H. W. DAVIES, *White Wyandotte*, hatched January 9.

R.—MAJOR J. A. MORRISON, D.S.O., *Wyandotte*, hatched January 3.

V.H.C.—J. H. EVANS, *Wyandotte.*

H.C.—MAJOR G. MUNDY, *White Wyandotte*, hatched February 8.

CLASS 55.—MINORCA, WYANDOTTE, LEGHORN, HAMBURG, FAVEROLLES OR FRENCH, PULLET, HATCHED IN 1921. [18 entries.]

I. (**£1.**)—W. E. H. HANCOCK, *White Wyandotte*, hatched January 2.

II. (**15s.**)—W. H. COOK, *White Wyandotte*, hatched January 2.

III. (**10s.**)—MAJOR G. MUNDY, *White Wyandotte*, hatched February 12.

R.—H. GUNN, *White Wyandotte*, hatched January 1.

V.H.C.—H. BLAMEY, *White Wyandotte*, hatched January 12.

H.C.—REV. R. L. COLLINS, *White Wyandotte*, hatched January 1.

CLASS 56.—GAME, MALAY, OR ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED, COCKEREL, HATCHED IN 1921. [9 entries.]

I. (£1.)—J. H. Baker & Son, *Indian Game*, hatched January 3.

II. (15s.)—Major J. A. Morrison, D.S.O., hatched January 3.

III. (10s.)—W. Brent, *Indian Game*, hatched January.

R.—E. C. Tucker, *Indian Game*.

V.H.C.—Miss M. H. Tucker, R.C., *Rhode Island Red*, hatched February 11.

H.C.—Miss M. H. Tucker, S.C., *Rhode Island Red*, hatched February 8.

CLASS 57.—GAME, MALAY, OR ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED, PULLET, HATCHED IN 1921. (11 entries.]

I. (£1.)—Northcott & Sons, *Indian Game*, hatched January 3.

II. (15s.)—W. Brent, *Indian Game*, hatched January.

III. (10s.)—J. H. Baker & Son, *Indian Game*, hatched January 3.

R.—T. A. Scott & Co., hatched January 1.

V.H.C.—Northcott & Sons, *Indian Game*, hatched January 3.

H.C.—N. Harris, *Indian Game*, hatched January 6.—Major J. A. Morrison, D.S.O., hatched January 3.

LIVE TABLE POULTRY.

CLASS 58.—PAIR OF COCKERELS OF ANY PURE BREED, HATCHED IN 1921. [9 entries.]

I. (£1.)—A. J. Falkenstein, *Sussex*, hatched January 2.

II. (15s.)—W. H. Cook, *Light Sussex*, hatched January 3.

III. (10s.)—A. C. Major, *Dorkings*, hatched January 4.

R.—Park House Poultry Farm, Ltd., *Light Sussex*, hatched January 6.

V.H.C.—Major J. A. Morrison, D.S.O., hatched January 3.

H.C.—E. G. Fisher, *Light Sussex*, hatched January 24.

CLASS 59.—PAIR OF PULLETS OF ANY PURE BREED, HATCHED IN 1921. [9 entries.]

I. (£1.)—J. H. Baker & Son, *Indian Game*, hatched January 3.

II. (15s.)—Mrs. L. M. Kenworthy, *Light Sussex*, hatched January 21.

III. (10s.)—A. C. Major, *Dorkings*, hatched January 4.

R.—A. J. Falkenstein, *Sussex*, hatched January 2.

V.H.C.—W. H. Cook, *Light Sussex*, hatched January 2.—Major J. A. Morrison, D.S.O., hatched January 3.

H.C.—Park House Poultry Farm, Ltd., *Light Sussex*, hatched January 6.

CLASS 60.—PAIR OF CROSS-BRED COCKERELS, HATCHED IN 1921. [2 entries.]

I. (£1.)—Lady Fitzgerald, *Indian Game-Orpington*, hatched January 10.

R.—Major G. Mundy, *Indian Game-Croad Langshan*, hatched February 1.

Class 61.—PAIR OF CROSS-BRED PULLETS, HATCHED IN 1921.
[2 entries.]

I. (**£1.**)—Mrs. A. Hambly, *Indian Game-Rhode Island Red*, hatched January 3

R.—Lady Fitzgerald, *Indian Game-Orpington*, hatched January 10

SPECIAL PRIZES.

Given by the Poultry Club.

Bath and West and Southern Counties Cup (*Value* £10 10*s.*), *for the Best Bird in the Show, the property of a Member of the Poultry Club. The Cup to be won three times, not necessarily in succession, by the same exhibitor before becoming his absolute property.* **I.**—W. Brent.

A Silver Egg Cup for best Cock or Cockerel in the Poultry Classes, the property of a Member of the Poultry Club. **I.**—A. C. Major.

A Silver Egg Cup for the best Hen or Pullet in the Poultry Classes, the property of a Member of the Poultry Club. **I.**—W. Brent.

The Associated Society's Bronze Medal for the best Bird in the Show. (*Winner need not be a Member of the Poultry Club*). **I.**—W. Brent.

DUCKS, GEESE AND TURKEYS.

Class 62.—DRAKE OR DUCK (Aylesbury). [1 entry].

II.—(**15s.**)—C. E. Purnell.

Class 63.—DRAKE OR DUCK (Rouen). [4 entries.]

I. (**£1.**)—Major J. A. Morrison, D.S.O.

II. (**15s.**)—Major J. A. Morrison, D.S.O.

R.—Abbot Bros.

Class 64.—DRAKE OR DUCK (Pekin)—First Prize, £1—Second, 15s.—Third 10s.

[No Award.]

Class 65.—GANDER OR GOOSE. [3 entries.]

I. (**£1.**)—Abbot Bros.

II. (**15s.**)—Major J. A. Morrison, D.S.O.

R.—H. Corrie.

Class 66.—TURKEY, COCK OR HEN. [3 entries.]

I. (**£1.**)—Mrs. F. Nagle, *Austrian White.*

II. (**15s.**)—Mrs. F. Nagle, *American Mommoth Bronze.*

R.—Abbot Bros.

DEAD TABLE POULTRY.

CLASS 67.—PAIR OF COCKERELS OF 1921, OF ANY PURE BREED.
[1 entrry.]

I. (**£1.**)—PARK HOUSE POULTRY FARM, LTD., *Light Sussex*, hatched January 6.

CLASS 68.—PAIR OF PULLETS OF 1921, OF ANY PURE BREED.
[1 entry.]

I. (**£1.**)—PARK HOUSE POULTRY FARM LTD., *Light Sussex*, hatched January 6.

CLASS 69.—PAIR OF CROSS-BRED COCKERELS OF 1921. [2 entries.]

I. (**£1.**)—MAJOR G. MUNDY, *Old English Game-Plymouth Rock*, hatched February 1.

R.—MRS. R. WITHERS, *White Wyandotte-Plymouth Rock-Buff Orpington*, hatched January 28.

CLASS 70.—PAIR OF CROSS-BRED PULLETS OF 1921. [1 entry.]

I. (**£1.**)—MRS. R. WITHERS, *White Wyandotte-Plymouth Rock-Buff Orpington*, hatched January 28.

CLASS 71.—PAIR OF DUCKLINGS OF 1921. [1 entry.]

I. (**£1.**)—MORNING STAR POULTRY ORCHARDS, *Aylesbury*, hatched April 1.

Bath and West and Southern Counties Society.

OBJECTS OF THE SOCIETY AND PRIVILEGES OF MEMBERSHIP.

ANNUAL EXHIBITIONS.

THE Society annually holds an Exhibition in some city or town in England or Wales. Each section of the Society's district is visited at intervals, so that most Members have an opportunity of seeing the Show in their own neighbourhood every few years. Prizes to a large amount are given for Horses, Cattle, Sheep, Pigs, Farm Produce, &c. Provision is also made for the exhibition of Agricultural Implements and Machinery, Seeds, Cattle Foods, Artificial Manures, and articles of general utility. A substantially built and completely equipped Working Dairy on a large scale is a special feature of these Exhibitions. Here explanatory demonstrations and comparative tests of implements and processes are carried on, with the assistance of well-known practical and scientific experts, and Butter-making Competitions are held. Among the features of the Annual Meeting are Shoeing, Milking and other Competitions, Poultry and Horticultural Shows, and Exhibitions illustrative of Bee-keeping, Home Industries, Manufactures, Nature Study and Forestry.

Membership entitles to free admission to the Annual Exhibition, and also to the Grand Stand overlooking the Horse and Cattle Ring to the Reserved Seats in the Working Dairy, and to the use of the Members' Special Pavilion for Luncheons Reading, Writing, &c.

Entries can be made by Members (elected on or before the last Tuesday i January preceding the Show, or who have paid two years subscription before th date of closing of entries), at about half the Fees payable by Non-Members.

THE JOURNAL.

All Members receive free of charge the Society's Journal, which is published annuall bound in cloth. It has for its aim the dissemination of agricultural knowledg in a popular form, and, in addition to original articles by well-known agricultura authorities, it contains particulars of the Society's general operations, full report of its experimental and research work, prize awards, financial statements, lists o Members, reviews of new books on agriculture, &c. (The price of the *Journal* t non-Members is 6s. 9d. post free.)

CHEMICAL AND OTHER FACILITIES.

The Society has a Consulting Chemist *from whom Members can obtain analyse and reports at reduced rates of charge.* An arrangement has also been mad under which Members of the Society can obtain, free of charge, from th National Fruit and Cider Institute at Long Ashton, analyses of cider-apples an perry-pears, and, with a view to assisting farmers and others in dealing wit insect and other pests which affect agriculture, horticulture, &c., the Counci have availed themselves of an offer from the Board of Economic Biology of th University of Bristol to investigate the nature of any insect or other pest an report upon it free of charge.

EXPERIMENTS.

Experiments on crops are conducted at experimental stations in various parts of the Kingdom, and *Members are enabled to take part in these and to receive reports thereon.*

ART-MANUFACTURES, NATURE STUDY, FORESTRY, &c.

One of the objects for which the Society was founded was the encouragement of Arts as well as Agriculture, and, to this end, exhibitions are held of Art-Manufactures and of work representative of Arts and Handicrafts. Exhibitions are also held illustrating Nature Study, as a branch of Education; the Science of Forestry, &c.

TERMS OF MEMBERSHIP.

ANNUAL SUBSCRIPTIONS.

Governors, not less than	£2
Ordinary Members, not less than	£1
Tenant Farmers, the rateable value of whose holdings does not exceed £200 a-year, not less than	10s.

Governors, who are eligible for election as President or Vice-President, are entitled, in addition to the privileges already mentioned, to an extra Season Ticket for the Annual Exhibition and for the Grand Stand, &c. Governors subscribing more than £2 are entitled to a further Ticket for every additional £1 subscribed.

Members subscribing less than £1 are entitled to all the privileges of Membership except that of entering Stock at reduced fees, and their admission Ticket for the Annual Show is available for *one day only* instead of for the whole time of the Exhibition.

LIFE COMPOSITIONS.

Governors may compound for their Subscription for future years by payment, in advance, of £20: and Members by payment, in advance, of £10. Governors and Members who have subscribed for twenty years may become Life Members on payment of half these amounts.

Any person desirous of joining the Society can be proposed by a Member, or by

F. H. Storr, O.B.E.,
Secretary and Editor.

3, Pierrepont Street, Bath.

Telegraphic Address—"Agriculture, Bath."

Telephone No. 610.

Bath and West and Southern Counties Society.

GENERAL LAWS

As revised in accordance with the Report of a Special Committee, which Report was received and adopted by the Annual General Meeting of Members, held on May 30, 1895.

COMPOSITION OF THE SOCIETY.

I. The Society shall consist of a President, Vice Presidents, Trustees, Council, Treasurer, Secretary, and Members.

OBJECTS.

II. The Society shall have the following objects:—

(*a*) To hold Exhibitions of breeding stock, agricultural implements, and such other articles connected with agriculture, arts, manufactures or commerce, as may be determined upon by the Council.

(*b*) To conduct practical and scientific investigations in agriculture.

(*c*) To promote technical education in agriculture by providing means of systematic instruction.

(*d*) To publish a Journal for circulation.

SUBSCRIPTIONS.

III. The Annual Subscription for Members shall be as follows:—

Governors (who are eligible for election as President or Vice President), not less than	£2
Ordinary Members, not less than	£1.
Tenant Farmers (the rateable value of whose holdings does not exceed £200 a-year), not less than . . .	10*s*

IV. The payment of £ 0 in one sum shall constitute a Governor for life, and of £10 in one sum an Ordinary Member for life, but any Governor who has subscribed not less than £2 annually for a period of twenty years may become a Life Governor on the further payment of £10 in one sum, and any Ordinary Member, who has subscribed not less than £1 annually for the same period may become a Life-Member on the further payment of £5 in one sum.

V. Subscriptions shall become due and be payable in advance on the 1st of January in each year or as soon as the Subscriber has been elected a Member. When the election takes place during the last quarter of the year the subscription payable on election will be considered as applying to the ensuing year.

VI. A Member shall be liable to pay his subscription for the current year unless he shall have given notice, in writing, to the Secretary before January 1st of his intention to withdraw.

GOVERNING BODY.

VII. The entire management of the Society—including the making of Bye-laws, election of Members, determining the Prizes to be awarded, appointing Committees, fixing the Places of Meetings and Exhibitions, appointing or removing the Treasurer, Secretary, and such other officers as may be required to carry on the business of the Society—shall be vested in the Council who shall report its proceedings at the Annual Meetings of the Society.

VIII. The Council shall consist of the Patron (if any), President, Vice-Presidents, Trustees, and Treasurer (who shall be *ex-officio* Members), and of sixty-six elected Members.

ELECTION OF PRESIDENT, VICE-PRESIDENTS, TRUSTEES AND COUNCIL.

IX. The election of a President for the year, of any additional Vice-Presidents or Trustees, and of the Members of Council representing the Divisions named in Law X., shall take place at the Annual Meeting of the Society, and they shall enter into office at the conclusion of the Exhibition during which such Annual Meeting has been held.

X. The sixty-six Members of the Council referred to in Laws VIII. and IX. shall consist of fifty-eight persons residing or representing property in the following Divisions, viz. :—

Twelve from the Counties of Devon and Cornwall, which shall be called the Western Division :

Twenty-four from the Counties of Somerset, Dorset, and Wilts, which shall be called the Central Division ;

Twelve from the Counties of Hants, Berks, Oxon, Bucks, Middlesex, Surrey, Sussex, and Kent, which shall be called the Southern Division ; and

Ten from the Counties of Worcester, Gloucester, Hereford and Monmouth, and the Principality of Wales which shall be called the North-Western Division.

The remaining eight shall be elected (irrespective of locality) from the general body of members, and shall form a Division which shall be called the "Without Reference to District" Division.

XI. One-half of the elected Members in each of the five Divisions named in Law X. shall retire annually by rotation, but shall be eligible for re-election.

XII. The Council shall have power to nominate a President, Vice Presidents, Trustees, and Members of Council for the approval of the Annual Meeting, and to fill up such vacancies in their own body as are left after the Annual Meeting, or as may from time to time occur during the interval between the Annual Meetings.

XIII. Nominations to offices, election to which is vested in the whole body of Members, must reach the Secretary ten days before the meeting at which such vacancies are to be filled up.

MEETINGS.

XIV. The Annual Meeting of the Society shall take place during the holding of the annual Exhibition.

XV. Special General Meetings of the Society may be convened by the President on the written requisition of not less than three Members of Council ; and all Members shall have ten days' notice of the object for which they are called together,

XVI. No Member of less than three months' standing, or whose subscription is in arrear, shall be entitled to vote at a Meeting.

EXHIBITIONS.

XVII. The Annual Exhibitions of the Society shall be held in different Cities or Towns in successive years.

XVIII. All Exhibitors shall pay such fees as may be fixed by the Council. Members subscribing not less than £1 per annum, who have been elected previous to February 1st, and have paid the subscription for the current year, or who pay two years subscription before the date of closing of entries, shall be entitled to exhibit at such reduction in these fees as the Council shall determine.

PRIZES.

XIX. All prizes offered at the cost of the Society shall be open for competition to the United Kingdom.

XX. No person intending to compete for any prize offered at the annual Exhibition shall be eligible to act as a judge or to have any voice in the selection of judges to award the premiums in the department in which he exhibits.

XXI. If it be proved to the satisfaction of the Council that any person has attempted to gain a prize in this, or in any other society, by a false certificate or by a misrepresentation of any kind, such person shall thereupon be, for the future excluded from exhibiting in this Society.

JOURNAL.

XXII. The Proceedings of the Society, Awards of Prizes, Financial Statements and Lists of Officers, Governors, and Members, shall be printed annually in the Society's *Journal*, and every Governor and Member, not in arrear with his subscription, shall be entitled to receive one copy, free of expense, and there shall be an additional number printed for sale.

POLITICS.

XXIII.—No motion or question of a political tendency shall be introduced at any meeting of the Society, otherwise than with the consent of two-thirds of the members present at any meeting, and then only after due notice in writing.

ALTERATIONS IN LAWS.

XXIV. No new General Law shall be made or existing one altered, added to or rescinded, except at an Annual or Special General Meeting, and then only provided that a statement of particulars, in writing, shall have been sent to the Secretary at least twenty-one days previous to the Meeting at which the question is to be considered.

LIST OF OFFICERS,

1921-22.

PATRON.

HIS MOST GRACIOUS MAJESTY THE KING.

PRESIDENT.

H.R.H. THE PRINCE OF WALES, K.G.

DEPUTY PRESIDENT.

The Right Hon. The Lord Clinton.

TRUSTEES.

*Bath, The Marquis of, K.G., Longleat, Warminster.
Edwards, C. L. F., The Court, Axbridge, Somerset.
Shelley, Sir. J., Bart., Shobrooke Park, Crediton.

VICE-PRESIDENTS.

Alexander, D. T.	Cardiff
Badcock, H. J.	Broadlands, Taunton
Baker, G. E. Lloyd	Hardwicke Court, Glouester
*Bath, Marquis of, K.G.	Longleat, Warminster
*Beaufort, Duke of	Badminton, Chippenham
Benyon, J. Herbert	Englefield House, Reading
*Bledisloe, Lord, K.B.E.	Lydney Park, Glos.
*Bute, Marquis of	The Castle, Cardiff
*Clinton, Lord	Bicton, East Budleigh, E. Devon
*Coventry, The Earl of	Croome Court, Worcester
Devonshire, Duke of	Chatsworth, Derbyshire
Edwards, C. L. F.	The Court, Axbridge, Somerset
Falmouth, Viscount	Tregothnan, Truro
Hambleden, Viscount	Greenlands, Henley-on-Thames
Hobhouse, Right Hon. H.	Hadspen House, Castle Cary
*Jersey, Earl of	Middleton Park, Bicester, Oxon.
*Lansdowne, Marquis of, K.G.	Bowood, Calne
*Llewelyn, Sir J. T. D., Bart.	Penllergaer, Swansea
Mount Edgcumbe, The Earl of	Mount Edgcumbe, Devonport

⁎ Those to whose names an asterisk (*) is prefixed have filled the office of President.

VICE-PRESIDENTS—*continued.*

NEVILLE GRENVILLE, R.	Butleigh Court, Glastonbury
NORTHUMBERLAND, DUKE OF	Albury Park, Guildford
*PLYMOUTH, EARL OF	Hewell Grange, Bromsgrove
POLTIMORE, LORD	Court Hall, North Molton, Devon
*RADNOR, THE EARL OF	Longford Castle, Salisbury
SHELLEY, SIR J., Bart.	Shobrooke Park, Crediton
SILLIFANT, A. O.	Culm Leigh, Stoke Canon, Exeter
SOMERSET, DUKE OF	Maiden Bradley, Bath
STRACHIE, LORD	Sutton Court, Pensford, Somerset
TEMPLE, EARL	Newton St. Loe, Bristol

THE LORD WARDEN OF THE STANNARIES.

THE SECRETARY AND KEEPER OF THE RECORDS OF THE DUCHY OF CORNWALL

THE RECEIVER GENERAL OF THE DUCHY OF CORNWALL.

⁎ Those to whose names an asterisk (*) is prefixed have filled the office of President

MEMBERS OF COUNCIL.

EX-OFFICIO MEMBERS.

The Patron
The President
The Vice Presidents
The Trustees
The Treasurer

ELECTED MEMBERS.

WESTERN DIVISION (Devon and Cornwall)

(12 *Representatives*)

Elected in 1920		*Elected in 1921*	
Name	*Address*	*Name*	*Address*
Buckingham Rev Preb	The Rectory Doddiscombsleigh Exeter	Boscawen Rev A T	Ludgvan Rectory Long Rock R S O Cornwall
Gibbs, A H	Pytte Clyst St George Topsham Devon	Chichester Major C H	Hall Bishops Tawton, Barnstaple
Moore Stevens Col R A	Woodhayes Whimple Devon	Daw J J	4 Louisa Terrace Exmouth
Shelley, J E	Postbury House Crediton	Lopes Sir Henry Y B, Bart	Maristow Roborough, South Devon
Studdy T L	Broxton Paignton	Martyn G	Liskeard Cornwall
Williams John	Scorrier House Scorrier Cornwall	Morley, Earl of	Saltram Plympton Devon

CENTRAL DIVISION (Somerset Dorset and Wilts)

(24 *Representatives*)

Beauchamp Sir F B	Woolboro House Peasedown St John Bath	Clark W H	Rutland Cottage Combe Down Bath
Bridgman H	Cleeve Hill Farm Bristol	Farwell Major T W	Hilton Estate Office Kilmersdon Bath
Bruford R	Nerrols Taunton		
Fox R A	Yate House Yate Glos	Gordon G H	The Barn House Sherborne Dorset
Gibson J L	Warren House Wrington		
Napier H B	Long Ashton Clifton Bristol	Hill Major V T	Woodspring Priory near Weston super Mare
Nichols G	Demerara House Colston Avenue Bristol	Hoare Sir H H A Bart	Stourhead Zeals, S O, Wilts
Parry Okeden Lt Col U E P	Turnworth, Blandford Dorset	Hurle J C	Kilve Court Bridgwater
		Knight S J	Buckingham Lodge Keynsham Bristol
Pearce, T H	Parsonage Farm, Long Ashton Bristol	Rawlence E A	St Andrew's Salisbury
Sanders Lieut Col Sir R A Bart M P	Bayford Lodge Wincanton	Rawlence G N	Salisbury
		Somerville A F	Dinder House Wells
Tudway C C	The Cedars Wells Somt	Watson Capt The Hon F H	Ormuston Milverton Somerset
Wynford Lieut Col Lord D S O	Wynford House Maiden Newton Dorset	White A R O B E	Charnage Mere Wilts

SOUTHERN DIVISION (Hants Berks Oxon, Bucks Middlesex Surrey, Sussex and Kent)

(12 *Representatives*)

Acland Rt Hon F Dyke, M P	93 Bedford Gardens Campden Hill London W 8	Ashcroft, W	1 The Waldrons Croydon
		Cobb H M	Higham Rochester
Best Major T G	East Carleton Manor Norwich	Cundall H M I S O F S A	4 Marchmont Gardens Richmond Hill Surrey
Jervoise F H T	Herriard Park, Basingstoke	Drummond Brig Gen H W	Board Room L &S W R Waterloo Stn, London
Latham T	Dorchester Oxon	Ismay J H	Iwerne Minster Blandford
Sutton, L P E	Sidmouth Grange, near Reading		
Thomas Stanford, C	Preston Manor, Brighton	Llewellyn Captain L L E	Hackwood Basingstoke

NORTH WESTERN DIVISION (Worcestershire, Gloucestershire, Herefordshire, Monmouthshire and Wales)

(10 *Representatives*)

Allsebrook, A	Link Elm Malvern Link	Ackers, C P.	Huntley Manor, Glos
Best, Capt W	Vivod Llangollen	Alexander H G	5 High Street, Cardiff
Cotterell, Sir J, Bart	Garnons, Hereford	Drummond Col F D W C B E	Cawdor Estate Office, Carmarthen
Lipscomb, G	Margam Park Estate Office, Port Talbot	Evans, H M G	Plasissa, Llangennech, Carmarthen
Mason, F F	Swansea	Williams, Major Jestyn	Miskin Manor, Pontyclun

WITHOUT REFERENCE TO DISTRICT DIVISION

(8 *Representatives*)

Bathurst, Sir F H, Bart, D S O	Somborne Park, Stockbridge, Hants	Lewis, Col H	Green Meadow, near Cardiff
Busk, W G	Wraxall Manor, Cattistock, Dorset	Masters, A	Kyneton, Thornbury, Glos
Miles, Lt-Col Sir C W, Bart	Manor House, Walton-in-Gordano, Clevedon, Somerset	Popham, H I	Hunstrete House, Pensford, Bristol
Storrar, J I	Tredegar Estate Office, Newport, Mon	Shaw, Col F S Kennedy	Teffont Magna, Salisbury

STANDING COMMITTEES, 1921-1922.

[The President is an *ex-officio* Member of all Committees.]

ALLOTMENT.

Edwards, C. L. F., *Chairman.*

Bath, Marquis of, K.G.
Bathurst, Sir F. H., Bart., D.S.O.
Best, Capt. W.
Mason, F. F.
Napier, H. B.
Studdy, T. E.
Wynford, Lieut.-Col. Lord, D.S.O.

CONTRACTS.

Napier, H. B., *Chairman.*

Allsebrook, A.
Bath, Marquis of, K.G.
Best, Capt. W.
Daw, J. E.
Edwards, C. L. F.
Mason, F. F.
Neville Grenville, R.
Rawlence, G. N.
Studdy, T. E.

DAIRY.

Somerville, A. F., *Chairman.*

Ashcroft, W.
Boscawen, Rev. A. T.
Clark, W. H.
Gibbs, A. H.
Gibson, J. T.
Hurle, J. C.
Knight, S. J.
Latham, T.
Llewellyn, L. T. E.
Napier, H. B.
Neville Grenville, R.
Strachie, Lord
Tudway, C. C.
White, A. R., O.B.E.

DISQUALIFYING.

The Stewards of Live Stock and Produce

EXPERIMENTS AND EDUCATION.

Lord Bledisloe, K.B.E., *Chairman.*

Ackers, C. P.
Alsebrook, A.
Ashcroft, W.
Baker, G. E. Lloyd
Benyon, J. H.
Gibson, J. T.
Hobhouse, Rt. Hon. H.
Hurle, J. C.
Ismay, J. H.
Latham, T.
Napier, H. B.
Neville Grenville, R.
Penberthy, Prof. J., F.R.C.V.S.
Rawlence, E. A.
Somerville, A. F.
Voelcker, Dr. J. A., M.A.
Wallace, Capt. T., M.Sc., M.C.

(With power to add to their number.)

FINANCE.

Napier, H. B., *Chairman.*

Daw, J. E.
Gibbs, A. H.

FORESTRY.

Lipscomb, G., *Chairman.*

Ackers, C. P.
Clinton, Lord
Drummond Col. F. D. W., C.B.E.
Duchesne, M. C.
Evans, H. M. G.
Hoare, Sir H. H. A., Bart.
Napier, H. B.

IMPLEMENT REGULATIONS.

Bath, Marquis of, K.G., *Chairman.*

Bathurst, Sir F. H., Bart., D.S.O.
Best, Capt. W.
Edwards, C. L. F.
Martyn, G.
Mason, F. F.
Moore-Stevens, Col. R. A.
Napier, H. B.
Neville Grenville R.
Studdy, T. E.

JOURNAL.

Edwards, C. L. F., *Chairman.*

Acland, Rt. Hon. F. D., M.P.
Baker, G. E. Lloyd
Bledisloe, Lord, K.B.E.
Hurle, J. C.

JUDGES' SELECTION.

Wynford, Lieut.-Col. Lord, D.S.O., *Chairman.*

Alexander, D.
Alexander, H. G.
Ashcroft, W.
Gordon, G.
Hoare, Sir H. H. A., Bart.
Latham, T.
Mason, F. F.
Moore-Stevens, Col. R. A.
Parry-Okeden, Lieut.-Col. U. E. P.

RAILWAY ARRANGEMENTS AND ADVERTISEMENTS.

Alexander, D.
Bath, Marquis of, K.G.
Bledisloe, Lord, K.B.E.
Coventry, Earl of
Drummond, Brig.-Gen H. W.
Mason, F. F.

(With power to add to their number.)

SCIENCE AND ART.

Bath, Marquis of, K.G., *Chairman.*

Acland, Rt. Hon., F. D., M.P.
Bledisloe, Lord, K.B.E.
Cundall, H. M. (I.S.O., F.S.A.)
Daw, J. E.
Evans, H. M. G.
Farwell, Major E. W.
Hobhouse, Rt. Hon. H.
Lipscomb, G.
Llewelyn, Sir J. T. D., Bart.
Napier, H. B.

(With power to add to their number.)

SELECTION.

The Chairman of all other Committees.

SHOW PLACE AND DATE.

Chairman of the Allotment, Contracts, Dairy, Finance, Forestry, Implement Regulations, Railway Arrangements, Science and Art, and Stock Prize Sheet Committees.
(With power to add two Local Members to their number.)

STOCK PRIZE SHEET.

Wynford, Lieut.-Col. Lord, D.S.O., *Chairman.*

Alexender, D.
Alexander, H. G.
Allsebrook, A.
Ashcroft, W.
Buckingham, Rev. Preb.
Busk, W. G.
Chichester Major C. H.
Clark, W. H.
Evans, H. M. G.
Gibbs, A. H.
Hoare, Sir H. H. A., Bart.
Latham, T.
Lewis, Col. H.
Mason, F. F.
Moore-Stevens, Col. R. A.
Shelley, J. F.
Sutton, E. P. F
White, A. R., O.B.E.
Williams, Major Jestyn

WORKS.

Edwards, C. L. F., *Chairman.*

Bath, Marquis of, K.G.
Bathurst, Sir F. H., Bart. D.S.O.
Best, Capt. W.
Mason, F. F.
Napier, H. B.
Studdy, T. E.

Stewards.

Cattle, Sheep and Pigs.
Ashcroft, W.
Moore-Stevens, Col. R. A.
Shelley, J. F.

Cider.
Farwell, Major E. W.

Dairy.
Somerville, A. F.
Clark, W. H.

Experiments.
Ashcroft, W.

Finance.
Napier, H. B.
Daw, J. E. Gibbs, A. H.

Forage.

Forestry.
Lipscomb, G.

Horses.
Wynford, Lieut.-Col. Lord, D.S.O.
Hoare, Sir H. H. A., Bart.

Horticulture.
Boscawen, Rev. A. T.

Poultry.
Studdy, T. E.

Science and Art.
Cundall, H. M. (I.S.O., F.S.A.)

Shoeing.
Mason, F. F.

Yard.
Edwards, C. L. F.
Bath, Marquis of, K.G.
Best, Capt. W.
Studdy, T. E.

Other Honorary Officials.

Treasurer—Luttrell, C. M. F.

Chaplain.
Boscawen, Rev. A. T.

Society's Representatives on Governing Bodies and Committees.

Dauntsey School Foundation—White, A. R.
National Fruit and Cider Institute—Napier, H. B., Ackers, C. P.
Sugar Beet Growers Society—Alexander, H. G.
South Eastern Agricultural College, Wye—Ashcroft, W.
Dairy Research Committee of University College, Reading—Latham, T.
Agricultural Education Committee of Wilts County Council—White, A. R.

Permanent Officials.

Secretary and Editor—Storr, F. H., O.B.E.
Assistant Secretary—Smith, W. A.

Auditor.
Goodman, F. C. (*Chartered Accountant*)

Consulting Chemist.
Voelcker, Dr. J. A. (M.A., F.I.C.)

Veterinary Inspector.
Penberthy, Prof. J. (F.R.C.V.S.)

Superintendent of Works.
Ayre, H. C.

Annual Exhibitions.

Year	Place Visited.	Prizes.				Total Local Contribution.	President.	Admissions.		
		Local Subscription.	Local Committee.	Local Societies	Local Residents.			On 2/6 Days.	On 1/- Days.	Total.
		£	£	£	£	£				
1852	Taunton	210	..	..	..	210	Lord Portman	..	..	..
1853	Plymouth	450	..	..	..	450	Sir T. D. Acland, Bart.	..	..	..
1854	Bath	450	..	..	..	450	William Miles, M.P.	..	..	..
1855	Tiverton	450	..	..	..	450	Earl Fortescue	..	..	..
1856	Yeovil	450	..	..	..	450	C. A. Moody, M.P.		..	.
1857	Newton Abbot	700	..	..	..	700	Lord Courtenay		..	.
1858	Cardiff	800	..	..	..	800	Lord Courtenay		..	.
1859	Barnstaple	800	85	..	81	966	John Sillifant	..	..	..
1860	Dorchester	900	..	..	..	900	Lord Rivers	10.709	11,949	22,658
1861	Truro	900	..	..	..	900	J. W. Buller, M.P.	15,201	14.220	29.421
1862	Wells	900	..	..	..	900	Sir T. D. Acland, Bart.	10,578	4,775	15,353
1863	Exeter	900	..	..	..	900	Marquis of Bath	15,635	19,284	34,919
1864	Bristol	1000	106	..	50	1156	Earl Fortescue	22,377	65,678	88,055
1865	Hereford	900	358	..	..	1258	Lord Taunton	16,575	35.261	51,836
1866	Salisbury	900	57	..	..	957	Earl of Portsmouth	7,288	18,737	26,025
1867	Salisbury	..					J. Tremayne	7,502	16,702	24,204
1868	Falmouth	900	..	..	..	900	Sir J. T. B. Duckworth, Bart.	11,393	19,495	30,888
1869	Southampton	900	132	..	18	1050	Earl of Carnarvon	15,340	41,290	56.630
1870	Taunton	900	..	..	..	900	Sir S. H. Northcote, Bart., C.B., M.P.	17.952	33.653	51,605
1871	Guildford	900	110	..	..	1010	Earl of Cork	10,656	23,406	34,06
1872	Dorchester	800	..	..	10	810	Duke of Marlborough, K.G.	12,791	21,517	34,30
1873	Plymouth	800	..	400	..	1200	Earl of Mount-Edgcumbe.	16,665	45,744	62,40
1874	Bristol	800	403	..	..	1203	Sir Massey Lopes, Bart., M.P.	37,329	72,791	110,1
1875	Croydon	800	245	..	..	1045	R. Benyon, M.P.	14.518	26,028	40,54
1876	Hereford	800	381	..	..	1181	Earl of Ducie	16.396	32,645	49,04
1877	Bath	800	215	..	..	1015	Marquis of Lansdowne	27,625	48.852	76.47
1878	Oxford	800	..	170	6	976	Earl of Jersey	12.414	26,995	39,40

Annual Exhibitions—*continued.*

Year.	Place Visited.	Local Subscription.	Prizes.			Total Local Contribution	President.	Admissions.			
			Local Committee	Local Societies	Local Residents			On 5/- Day.	On 2/6 Days.	On 1/- Days.	Total.
		£	£	£	£	£					
1879	Exeter .	800	..	..	10	810	Earl of Morley . . .	..	14,634	40,533	55,167
1880	Worcester	800	..	254	..	1054	Earl of Coventry	..	8,415	37,675	46,090
1881	Tunbridge Wel	800	245	34	..	1079	Marquis of Abergavenny. .	..	13,368	33,236	46,604
1882	Cardiff .	800	200	198	17	1215	Lord Tredegar	..	23,941	38,680	62,621
1883	Bridgwater	800	78	..	..	878	Lord Brooke, M P.	..	17,171	31,241	48,412
1884	Maidstone	800	310	33	75	1218	Viscount Holmesdale . . .	..	13,501	31,053	44,554
1885	Brighton	800	227	33	82	1142	Viscount Hampden . . .	..	9,637	39,851	49,488
1886	Bristol .	800	525	..	..	1325	Lord Carlingford	..	29,580	70,999	100,579
1887	Dorchester	800	..	112	..	912	Earl of Ilchester	..	8,860	29,846	38,706
1888	Newport (Mon	800	100	..	.	900	Lord Tredegar	..	14,878	38,567	53,445
1889	Exeter .	800	..	..	10	810	Lord Clinton	..	16,405	36,195	52,600
1890	Rochester	800	294	..	26	1120	Earl of Darnley	..	3,480	48,314	51,794
1891	Bath .	800	50	103	100	1053	Earl Temple	..	23,510	52,185	75,695
1892	Swansea .	800	200	100	10	1110	Sir J. D. T. Llewelyn, Bart. .	..	18,364	54,609	72,973
1893	Gloucester	800	400	..	..	1200	Lord Fitzhardinge	..	14,272	40,368	54,640
1894	Guildford	800	174	..	10	984	Earl of Onslow	..	8,671	29,813	38,484
1895	Taunton .	800	85	160	10	1055	Viscount Portman	..	13,181	30,111	43,292
1896	St. Albans	800	152	..	..	952	Earl of Clarendon	..	12,056	22,380	34,436
1897	Southampton	800	50	..	..	850	Lord Montagu of Beaulieu .	..	8,284	33,750	42,034
1898	Cardiff .	800	200	..	..	1000	Lord Windsor	..	13,101	42,501	55,602
1899	Exeter .	800	..	225	5	1030	Lord Clinton	..	16,091	39,832	55,923
1900	Bath .	800	100	150	10	1060	Marquis of Bath	954	11,601	36,814	49,369
1901	Croydon .	800	115	..	..	915	H.R.H. The Duke of Cornwall and York, K.G. - .	1,196	9,362	30,693	41,251
1902	Plymouth	800	105	100	36	1041	Earl of Morley	842	12,629	40,565	54,036
1903	Bristol .	800	434	50	61	1345	Duke of Beaufort	..	34,528	74,352	108,880
1904	Swansea .	800	350	..	..	1150	Lord Windsor	..	28,265	50,562	78,827

ANNUAL EXHIBITIONS—*continued.*

Year.	Place Visited.	Local Subscr'ption	Prizes: Local Committee	Prizes: Local Societies	Prizes: Local Residents	Total Local Contribution	President	Admissions: On 5/- Day.	Admissions: On 2/6 Days	Admissions: On 1/- Days.	Admissions: Total.
		£	£	£	£	£					
1905	Nottingham	800	.	218		1018	Duke of Portland, K.G	..	8,913	45,964	54.877
1906	Swindon .	800		200	50	1050	Earl of Radnor	..	7.838	42,013	49.851
1907	Newport (Mon.)	800	201	51	29	1081	H R H. The Prince of Wales, K G	..	16,236	37,819	54,055
1908	Dorchester .	800	100	25	..	925	Lord Digby . . .	..	12,227	20,350	32,577
1909	Exeter	800	..	100	..	900	Lord Clinton .	..	14,898	41,891	56,789
1910	Rochester and Chatham	800	117	..	..	917	Earl of Darnley .	..	5,892	20,105	25,997
1911	Cardiff	800	195	110	10	1115	Marquis of Bute . . .	..	16,213	40,588	56,801
1912	Bath . .	800	100	100	..	1000	Marquis of Bath . . .	.	13,843	40,935	54,788
1913	Truro . .	800	35	115	39	918	Viscount Falmouth .	..	12,918	44,700	57,618
1914	Swansea	800	301			1101	Sir J T. D. Llewelyn, Bart .	..	17,957	67 805	85,762
1915	Worcester .	400	.	257	..	657	The Earl of Coventry . .	..	7,760	28.013	35,773
1916 to 1919	No Shows						The Earl of Coventry . .				
									4/–	2/–	
1920	Salisbury .	800	24	105	131	1060	The Earl of Radnor .	..	19,392	25,255	44,647
1921	Bristol . .	800	1000	354	..	2154	The Lord Bledisloe, K.B.E. .	5105	36,068	58.473	99 646
1922	Plymouth .	800	132	281		1213	H R H. The Prince of Wales K G .				

Members' Privileges.

ANALYSES OF FERTILISERS, FEEDING STUFFS, WATERS, SOILS, &c.

Applicable only to the case of Persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis).

Members of the Bath and West and Southern Counties Society, who may also be Members of other Agricultural Societies, are particularly requested in applying for Analyses, to state that they do so as Members of the first-named Society.

THE following are the rates of Charges for Chemical Analyses to Members of the Society.

These privileges are applicable only when the analyses are for *bona-fide* agricultural purposes, and are required by Members of the Society for their own use and guidance in respect of farms or land in their own occupation and within the United Kingdom.

The analyses are given on the understanding that they are required for the individual and sole benefit of the Member applying for them, and must not be used for other persons, or for commercial purposes.

Land or estate agents, bailiffs, and others, when forwarding samples are required to state the names of those Members on whose behalf they apply.

Members are also allowed to send for analysis under these privileges any manures or feeding-stuffs to be used by their outgoing tenants, or which are to be given free of cost to their occupying tenants.

The analyses and reports may not be communicated to either vendor or manufacturer, except in cases of dispute.

Members are requested, when applying for an analysis, to quote the number in the subjoined schedule under which they wish it to be made.

No.		
1.	—An opinion of the purity of bone-dust or oil-cake(each sample)	2*s*. 6*d*.
2.	—An analysis of sulphate or muriate of ammonia, or of nitrate of soda, together with an opinion as to whether it beworth the price charged	5*s*.
3.	—An analysis of guano, showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts and ammonia,- together with an opinion as to whether it be worth the price charged	10*s*.
4.	—An analysis of mineral superphosphate of lime for soluble phosphates only, together with an opinion as to whether it be worth the price charged	5*s*.
5.	—An analysis of superphosphate of lime, dissolved bones, etc.. showing the proprotions of moisture, organic matter, sand. soluble and insoluble phosphates. sulphate of lime and ammonia, together with an opinion as to whether it be worth the price charged	10*s*.
6.	—An analysis of bone-dust, basic slag, or any other ordinary artificial manure together with an opinion as to whether it be worth the price charged	10*s*.
7.	—An analysis of compound artificial manures, animal products, refuse substances used for manure etc.	from 10*s*. to £1
8.	—An analysis of limestone, showing the proportion of lime	7*s*. 6*d*.
9.	—An analysis of limestone, showing the proportion of lime and magnesia	10*s*.
10.	—An analysis of limestone or marls, showing the proportion of carbonate, phosphate, and sulphate of lime and magnesia, with sand and clay	10*s*.
11.	—Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime	£1
12.	—Complete analysis of a soil	£3
13.	—An analysis of oil-cake or other substance used for feeding purposes, showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre as well as of starch, gum, and sugar in the aggregate ; and an opinion of its feeding and fattening or milk-producing properties	10*s*.
14.	—Analysis of any vegetable product	10*s*.
15.	—Determination of the "hardness" of a sample of water before and after boiling ..	5*s*.
16.	—Analysis of water of land-drainage, and of water used for irrigation	£1
17.	—Analysis of water used for domestic purposes..	£1 10*s*.
18.	—An analysis of milk (to assist Members in the management of their Dairies and Herds, *bona-fide* for their own information and not for trade purposes, nor for use in connection with the Sale of Food and Drugs Acts)	5*s*.
19.	—Personal consultation with the Consulting Chemist. (To prevent disappointment it is suggested that Members desiring to hold a consultation with the Consulting Chemist should write to make an appointment)	5*s*.
20.	—Consultation by letter	5*s*.
21.	—Consultation necessitating the writing of three or more letters	10*s*.

Members wishing to exercise their privileges on the above-named terms, should forward their samples for examination *by post or parcel prepaid*, to the Consulting Chemist, DR. JOHN AUGUSTUS VOELCKER, M.A., F.I.C., Stuart House, 1, Tudor Street, London. E.C.

The fees for analysis must be sent to the Consulting Chemist at the time of application.

GUIDE TO PURCHASERS OF FERTILISERS AND FEEDING STUFFS.

Purchasers are recommended in every case to insist upon having an *Invoice* given to them. This invoice should set out clearly :—

In the case of **Fertilisers**—
- (1) The **name** of the fertiliser ;
- (2) Whether the fertiliser be artificially **compounded** or not ;
- (3) The **analysis** guaranteed in respect of the principal fertilising ingredients

In the case of **Feeding-Stuffs** -
- (1) The **name** of the article ;
- (2) The **description** of the article : whether it has been made from one substance or seed only, or from more than one ;
- (3) The **analysis** guaranteed in respect of Oil and Albuminoids.

(NOTE.—The use of terms "Linseed-cake," "Cotton-cake," etc., implies that these cakes shall be "pure" and purchasers are recommended to insist upon these terms being used without any qualification such as "95 per cent.," "as imported," etc. "Oil cake" should be avoided.

Members of the Society should see that the **Invoices** agree accurately with the orders given by them, and, in giving these orders, they should stipulate that the goods come up to the guarantees set out in the following list, and that they be sold **subject to the analysis and report of the Consulting Chemist of the Bath and West and Southern Counties Society.**

FERTILISERS.

Raw Bones, Bone-meal, or **Bone-dust** to be guaranteed "PURE," and to contain not less than 45 per cent. of Phosphate of Lime, and not less than 4 per cent. of Ammonia.

Steamed or "Degelatinised" Bones to be guaranteed "PURE," and to contain not less than 55 per cent. of Phosphate of Lime, and not less than 1 per cent. of Ammonia.

Mineral Superphosphate of Lime to be guaranteed to contain a certain percentage of "Soluble Phosphate." [From 25 to 28 per cent. of Soluble Phosphate is an ordinarily good quality.]

Dissolved Bones to be guaranteed to be "made from raw bone and acid only." and to be sold as containing stated percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia.

Compound Artificial Manures, Bone Manures, Bone Compounds, etc., to be sold by analysis stating the percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia contained.

Basic Slag to be guaranteed to contain a certain percentage of Phosphoric Acid, and to be sufficiently finely ground that 80 to 90 per cent. passes through a sieve having 10,000 meshes to the square inch.

Peruvian Guano to be described by that name, and to be sold by analysis stating the percentages of Phosphates and Ammonia.

Sulphate of Ammonia to be guaranteed to be "PURE," and to contain not less than 24 per cent. of Ammonia.

Nitrate of Soda to be guaranteed to be "PURE," and to contain 95 per cent. of Nitrate of Soda.

Kainit to be guaranteed to contain 23 per cent. of Sulphate of Potash.

All fertilisers to be delivered in good and suitable condition for sowing.

FEEDING-STUFFS.

Linseed Cake, Cotton Cake (Decorticated and Undecorticated), and **Rape Cake** (for feeding purposes) to be pure, i.e., prepared *only* from one kind of seed from which their name is derived, and to be in sound condition. The report of the Consulting Chemist of the Bath and West and Southern Counties Society to be conclusive as to the " purity " or otherwise of any feeding-stuffs. The percentages of Oil and Albuminoids must also be guaranteed.

Mixed Feeding Cakes, Meals, etc., to be sold on a guaranteed analysis.

All Feeding-Stuffs to be sold in sound condition. and to contain nothing of a injurious nature or worthless for feeding purposes.

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

GENERAL RULES.

1.—A sample taken for analysis should be fairly *representative of the bulk* from which it has been drawn.

2.—The sample should reach the Analyst *in the same condition* as it was at the time when drawn.

FERTILISERS.

When **Fertilisers** are delivered in bags, select four or five of these from the bulk, and either turn them out on a floor and rapidly mix their contents, or else drive a shovel into each bag and draw out from as near the centre as possible a couple of shovelfuls of the manure. and mix these quickly on a floor.

Halve the heap obtained in either of these ways, take one-half (rejecting the other) and mix again rapidly. flattening down with the shovel any lumps that appear. Repeat this operation until at last only some three or four pounds are left.

From this fill three tins, holding from ½lb. to 1lb. each, mark, fasten up and seal each of these. Send one for analysis, and retain the others for reference.

Or,—the manure may be put into glass bottles provided with well-fitting corks; the bottles should be labelled and the corks sealed down. The sample sent for analysis can be packed in a wooden box and sent by post or rail.

When manures are delivered in bulk, portions should be successively drawn from *different parts* of the bulk, the heap being turned over now and again. The portions drawn should be thoroughly mixed, sub-divided, and, finally, samples should be taken as before, except that when the manure is coarse and bulky it is advisable to send larger samples than when it is in a finely-divided condition.

FEEDING-STUFFS.

Linseed, Cotton, and other Feeding Cakes.—If a single cake be taken three strips should be broken off right across the cake and from the middle portion of it, one piece to be sent for analysis, and the other two retained for reference. Each of the three pieces should be marked, wrapped in paper, fastened up and sealed. The piece forwarded for analysis can be sent by post or rail.

A more satisfactory plan is to select four to six cakes from different parts of the delivery, then break off a piece about four inches wide from the middle of each cake, and pass these pieces through a cake-breaker. The broken cake should then be well mixed, and three samples of about 1lb. each should be taken and put in tins or bags duly marked, fastened, and sealed as before. One of these lots should be sent for analysis, the remaining two being kept for reference. It is advisable also, with the broken pieces, to send a small strip from an unbroken cake.

Feeding Meals, Grain, etc.—Handfuls should be drawn from the centre of half-a-dozen different bags of the delivery: these lots should then be well mixed, and three ½lb. tins or bags filled from the heap, each being marked, fastened up, and sealed. One sample is to be forwarded for analysis and the others retained for reference.

SOILS, WATERS, &c.

Soils.—Have a wooden box made, 6 inches in length and width, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil and its subsoil 9 to 12 inches deep; trim this block to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up gently, turn over the box, nail on the lid, and send by rail. The soil will then be received in the position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

Waters.—Samples of water are best sent in glass-stoppered Winchester bottles holding half a gallon. One such bottle is sufficient for a single sample. Care should be taken to have these scrupulously clean. In taking a sample of water for analysis it is advisable to reject the first portion drawn or pumped, so as to obtain a sample of the water when in ordinary flow. The bottle should be rinsed out with the water that is to be analysed, and it should be filled nearly to the top. The stopper should be secured with string, or be tied over with linen or soft leather. The sample can then be sent carefully packed either in a wooden box with sawdust, etc., or in a hamper with straw.

Milk.—A pint bottle should be sent in a wooden box.

GENERAL INSTRUCTIONS.

Time for Taking Samples.—All samples, both of fertilisers and feeding-stuffs, should be taken as soon after their delivery as possible, and should reach the Analyst within *ten days* after delivery of the article. In every case it is advisable that the Analyst's certificate be received before a fertiliser is sown or a feeding-stuff is given to stock.

Procedure in the event of the Vendor wishing Fresh Samples to be Drawn.—Should a purchaser find that the Analyst's certificate shows a fertiliser or feeding-stuff not to come up to the guarantee given him, he may inform the vendor of the result and complain accordingly. He should then send to the vendor *one* of the two samples which he has kept for reference. If, however, the vendor should demand that a fresh sample be drawn, the purchaser must allow this, and also give the vendor an opportunity of being present, either in person or through a representative whom he may appoint. In that case, three samples should be taken in the presence of both parties with the same precautions as before described, *each* of which should be duly packed up, labelled and *sealed* by both parties. One of these is to be given to the vendor, one is to be sent to the Analyst, and the third is to be kept by the purchaser for reference or future analysis if necessary.

All samples intended for the Consulting Chemist of the Society should be addressed (postage or carriage prepaid) to Dr. J. AUGUSTUS VOELCKER, M.A., F.I.C., Stuart House, 1, Tudor Street, New Bridge Street, London, E.C. Separate letters of instruction should be sent at the same time.

PLYMOUTH MEETING,

JUNE 1, 2, 3, 5 and 6, 1922.

MONEY PRIZES.

				PAGE
Horses	£1,163	5	0	cxxxvi
Cattle	1,275	0	0	cxliii
Sheep	784	0	0	cxlix
Goats	32	15	0	clii
Pigs	376	0	0	cliii
Cider	30	0	0	clvi
Cheese	57	0	0	clvi
Cream Cheese, Butter and Cream	70	10	0	clvi
Butter-Making	46	10	0	clviii
Milking	13	7	0	clviii
Shoeing	58	10	0	clvix
Poultry	163	10	0	clxxi
	£4,070	7	0	

DONORS OF MEDALS, PLATE, &c.

The President (H.R.H. The Prince of Wales, K.G.)
Bath and West Society
Devon County Agricultural Association
Shire Horse Society
Hunters' Improvement and National Light Horse Breeding Society
Welsh Pony and Cob Society
National Pony Society
Hackney Horse Society
Rotary Club of Plymouth
J. F. Winnicott, Esq. (Mayor of Plymouth)
Major A. C. Morrison-Bell, M.P.
Major E. F. Morrison-Bell
South Devon Herd Book Society
Western Morning News and Mercury
Sir Henry Lopes, Bart.
Shorthorn Society
Aberdeen-Angus Cattle Society
English Aberdeen-Angus Cattle Association
Sussex Herd Book Society
Captain G. H. Johnstone
English Kerry and Dexter Cattle Society
English Guernsey Cattle Society
English Jersey Cattle Society
A. T. Loram, Esq.
P. Whitton, Esq.
Col. G. Craven Hoyle
Southdown Sheep Society
British Goat Society
British Berkshire Society
National Pig Breeders' Association
Gloucestershire Old Spots Pig Society
Wessex Saddleback Pig Society
Poultry Club

DONORS OF MONEY PRIZES.

Bath and West and Southern Counties Society	£2944	2	6
The President (H.R.H. The Prince of Wales, K.G.) ..	10	0	0
Plymouth Local Committee	117	0	0
Devon County Agricultural Association	250	0	0
Shire Horse Society (or Medal)..	15	0	0
Suffolk Horse Society	36	0	0
British Percheron Horse Society	22	0	0
Captain H. G. Hawker	5	5	0
Devon Cattle Breeders' Society..	37	0	0
South Devon Herd Book Society	30	0	0
Shorthorn Society..	30	0	0
Dairy Shorthorn Association	10	0	0
E. Ezra. Esq.	17	0	0
Hereford Herd Book Society	20	0	0
Sussex Herd Book Society	17	0	0
Red Poll Cattle Society	34	0	0
English Aberdeen-Angus Cattle Association	10	0	0
British Friesian Cattle Society	30	0	0
English Jersey Cattle Society (or Medal)	20	0	0
English Guernsey Cattle Society	30	0	0
English Kerry and Dexter Cattle Society	15	0	0
South Devon Flock Book Association..	10	0	0
Kent or Romney Marsh Sheep Breeders' Association	17	0	0
Southdown Sheep Society	17	0	0
Hampshire Down Sheep Breeders' Association ..	20	0	0
Oxford Down Sheep Breeders' Association	10	0	0
Dorset Horn Sheep Breeders' Association	17	0	0
Dorset Down Sheep Breeders' Association	15	0	0
Exmoor Horn Sheep Breeders' Society	10	0	0
Dartmoor Sheep Breeders' and Flock Book Association	10	0	0
Suffolk Sheep Society	25	0	0
Ryeland Flock Book Society	15	0	0
British Goat Society	16	7	6
British Berkshire Society	9	0	0
Large Black Pig Society	50	0	0
National Pig Breeders' Association	20	0	0
Long White Lop-Eared Pig Society	20	0	0
Gloucestershire Old Spots Pig Society	20	0	0
Wessex Saddleback Pig Society..	30	0	0
Trustees of John Boscawen Prize Fund, Cornwall ..	6	0	0
G. J. L. Lang, Esq., J.P., Saltash	2	2	0
Devon County Agricultural Committee..	31	10	0
	£4,070	7	0

(In addition to the above, prizes are offered for Allotments and Small Holdings and for Milk-Recorded Herds and Clean Milk Production, towards which the President (H.R.H. The Prince of Wales, K.G.), the Deputy President (Lord Clinton), Lord Astor, Lord St. Levan, The Plymouth Local Committee, the Devon County Agricultural Association, Mr. G. Martyn, and the Members of the Devon County Council Small Holdings Committee contribute).

PRIZES.

£250 towards the Prizes in the Horses, Cattle, Sheep and Pig Classes are contributed by the Devon County Agricultural Association, and the Prizes in Classes 46, 47 and 248 to 258 by or through the Plymouth Local Committee.

An Animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of those Prizes headed as Champion or Special Prizes

HORSES.

Entry Fees, including Box: Members, 30/-; Non-Members, 60/- each entry.

Exhibitors are requested to note that Animals entered in Classes 1 to 14 and 248 and 249 must be in the Yard before 8 a.m., on Thursday, June 1st, and except the Stallions in Classes 5, 6, 10, 11 and 14 (which can **be removed after the Parade of Horses on the third day of the Show)** must remain in the Yard till 6 o'clock on Tuesday, June 6th.

SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book).

Judge - T. FOWLER, Stud Farm, Tring, Herts.

Class.	First Prize. £	Second Prize. £	Third Prize. £
1.—Mare, in-foal, or with foal at foot	15	10	3
2.—Filly or Gelding, foaled in 1921	10	5	3
3.—Filly or Gelding, foaled in 1920	10	5	3
4.—Filly or Gelding, foaled in 1919	10	5	3
5.—Stallion, foaled before 1920	15	10	3
6.—Stallion, foaled in 1920	10	5	3
7.—Colt, foaled in 1921	10	5	3

MEDAL.

Offered by the Shire Horse Society.

	£
(A) A Gold Medal, or the sum of £10, for the best Mare or Filly in the Shire Horse Classes, under Condition 47,	10
and to the Breeder of the winner under the Condition stated, a prize of	5

SUFFOLK.

Judge—S. WOODIWISS, Graveleys, Great Waltham, Chelmsford.

£36 towards the Prizes in Classes 8 to 11 are contributed by the Suffolk Horse Society.

Class.	First Prize. £	Second Prize £	Third Prize. £
8.—Filly, foaled in 1920	**10**	**5**	**3**
9.—Filly, foaled in 1919	**10**	**5**	**3**
10.—Stallion, foaled in 1919	10	5	3
11.—Stallion, foaled in 1920	10	5	3

PERCHERONS.

Judge —Hon. A. E. PARKER, Norton Curlieu, Warwick.

£22 towards the Prizes in Classes 12 to 14 are contributed by the British Percheron Horse Society.

Class.			
12.—Mare, in-foal, or with foal at foot	**10**	**5**	**3**
13.—Colt or Filly Foal produce of Mare in Class 12 .. **(Entry fee : Members, 5/-, Non-Members, 10/-).**	5	3	
14.—Colt, Filly or Gelding, foaled in 1919 or 1920..	10	5	3

ANY AGRICULTURAL BREED.

248. Mare or Gelding, foaled before 1920. the property of a farmer residing within 30 miles of Plymouth	**4**	**2**	**1**
249.—Pair of Mares or Geldings, foaled before 1920, the property of a farmer residing within 30 miles of Plymouth	**5**	**3**	**2**

HUNTERS.

Judge—Hon. A. E. PARKER, Norton Curlieu, Warwick.

Animals entered in Classes 15 to 26 and 250 and 251 must be in the Yard before 8 a.m. on Thursday, June 1st, and must remain there till 4 p.m. on Saturday, June 3rd, when they must be removed from the Yard.

15.—Mare, in-Foal, or with Foal at Foot	15	10	3
16.—Filly, Colt or Gelding, foaled in 1921	10	5	3
17.—Filly, Colt or Gelding, foaled in 1920	10	5	3
18.—Filly or Gelding, foaled in 1919	10	5	3
19.—Mare or Gelding, foaled in 1918, to carry 14 stone and over	10	5	3
20.—Mare or Gelding, foaled in 1918, to carry under 14 stone	10	5	3
21.—Mare or Gelding, foaled before 1919, to carry not more than 12 stone 7lbs.	20	10	3
22.—Mare or Gelding, foaled before 1919, to carry over 12 stone 7lbs. and under 14 stone	20	10	3
23.—Mare or Gelding, foaled before 1919 to carry 14 stone or over	20	10	3

HUNTERS—*continued.*

Class.		First Prize. £	Second Prize. £	Third. Prize. £
24.—	Mare or Gelding, foaled before 1919, that has not won a Prize of £10 or over under Saddle at any Show held previous to April 15th, 1922	10	5	3
25.—	Mare or Gelding not exceeding 6 years old, the property of a farmer in Devon	10	5	3
26.—	Selling Class—Mare or Gelding, three years old or over	10	5	3

(**Any Animal entered in Class 26 may be claimed for 100 guineas. Claims must be deposited in writing at the Secretary's Office in the Show Yard not later than 4 p.m. on the day of Judging, and if there be more than one claim for any horse the horse will be put up for sale by an auctioneer appointed by the Society and any surplus received over the amount stated shall be equally divided between the exhibitor and the Society.**)

Class.		First Prize. £	Second Prize. £	Third. Prize. £
250.—	**Mare or Gelding, foaled before 1919, the property of a resident within 30 miles of Plymouth, to carry over 12 stone 7lbs. and under 14 stone ..**	**6**	**3**	**2**
251.—	**Mare or Gelding, foaled before 1919, the property of a resident within 30 miles of Plymouth, to carry 14 stone or over .. ..**	**6**	**3**	**2**

SPECIAL PRIZE.

Offered by Captain H. G. Hawker.

(B) For the best Animal entered in Classes 19 to 26, 250 or 251, that has been fairly hunted with a recognised pack of Foxhounds, Staghounds or Harriers in Devon or Cornwall, during the past season. A certificate to this effect to be produced from the Master of the Hounds .. .. £5 5s.

MEDALS.

Offered by the Hunters' Improvement and National Light Horse Breeding Society, under Conditions 48 and 49.

(C) A Gold Medal, or £5 and a Bronze Medal, for the Best Hunter Brood Mare in Class 15, registered with a number in the Hunter Stud Book, at the time of entry or within a month of the award, not having previously won the above-named Society's Gold Medal as a Brood Mare in 1922, and which must have her foal at foot, or produce a living foal in 1922 to a thoroughbred horse or Registered Hunter sire. In the second instance a certificate to that effect must be forwarded before the Medal is sent.

(D) A Silver Medal or £1 (at the option of the winner), for the best Hunter Mare or Gelding of any age, exhibited by a member of the Hunters' Improvement and National Light Horse Breeding Society, in Classes 19 to 26, whose subscription to that Society must be paid within a month of the award.

Only Prize-Winners in the Classes will be eligible for these Medals.

PONIES.

Animals entered in Classes 27 to 34 and 252 must be brought into the yard after 6 p.m. on Saturday, June 3rd, and before 8 a.m. on Monday, June 5th, and must remain in the Yard until 6 p.m. on Tuesday, June 6th.

WELSH MOUNTAIN PONIES.

Judge—J. R. BACHE, The Cedars, Knighton, Radnorshire.

CLASS.	First Prize. £	Second Prize. £	Third Prize £
27.—BROOD MARE, foaled in or before 1918, not exceeding 12 hands, neither docked or hogged, in-foal or with foal at foot, and must produce a foal in 1922 before receiving a prize	10	5	3
28.—STALLION, foaled in or before 1918 not exceeding 12 hands and neither docked or hogged	10	5	3

MOUNTAIN AND MOORLAND PONIES (other than Welsh Mountain).

Judge—W. R. SMYTH, Orswell, Stoke Rivers, near Barnstaple.

The First Prizes in Classes 29 and 32 are given by the President (H.R.H. The Prince of Wales, K.G.)

29.—MARE, not exceeding 13 hands, in-foal or with foal at foot	5	3	2
30.—MARE, not exceeding 12.2 hands, in foal or with foal at foot	5	3	2
31.—MARE or GELDING, not exceeding 13.2 hands, to be ridden	5	3	2
32.—STALLION, not exceeding 13 hands	5	3	2
252. Mare or Gelding, not exceeding 12.2 hands, the property of a resident within 30 miles of Plymouth..	**3**	**2**	**1**

OTHER PONIES.

Judge—W. R. SYMTH, Orswell, Stoke Rivers, near Barnstaple.

33.—MARE, not exceeding 14.3 hands, suitable to breed Polo or Riding Ponies, in-Foal, or with Foal at foot	8	5	3
34.—MARE or GELDING, exceeding 13.2 and not exceeding 15 hands, made or un-made, to be ridden ..	8	5	3

MEDALS.

Offered by the National Pony Society.

(E) A Silver Medal for the best Polo Pony Brood Mare in the Brood Mare Class, entered or eligible for entry in the National Pony Stud Book.

This Medal is offered subject to Condition No. 51.

HARNESS AND SADDLE.

Judges:—

Harness—C. E. C. COOKE, The Close, Biggleswade, Beds.

Saddle—Hon. A. E. PARKER, Norton Curlieu, Warwick.

Entry fees: With Box, Members, 30/-; Non-Members, 60/- each entry; without Box: Members, 5/-; Non-Members, 10/-.

ENTRIES CLOSE { With Boxes—April 8, or at double fees, April 15. Without Boxes—at 12 noon on the day preceding the Competition.

Horses entered in other Classes can, if eligible, be also entered on payment of an additional fee in the Harness and Saddle Classes.

Horses entered in the Harness and Saddle Classes **only**, and not having a Box in the yard, must be in the Show Yard by 1 p.m. on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as the class has been judged.

CLASS.	First Prize £	Second Prize £	Third Prize £
35.—MARE or GELDING, under 15 hands, to be driven in harness on the 1st day of the Show	10	5	2
36.—MARE or GELDING, any height, for riding purposes, to be shown in saddle on the 1st day of the Show	10	5	2
37.—MARE or GELDING, 15 hands or over, to be driven in harness on the 2nd day of the Show	10	5	2
38.—PONY, not exceeding 13 hands, suitable for, and to be ridden by, a child not over 14 years of age, on the second day of the Show	6	4 Fourth £1	2

(A Whip will be presented to the best Boy and best Girl Riders in this Class.)

CLASS.	First Prize £	Second Prize £	Third Prize £
39.—Weight-carrying COB, not over 15 hands, to carry not less than 14 stone, to be shown in saddle on the 2nd day of the Show	10	5	2
40.—MARE or GELDING, any height, that has not previously won a First Prize at the Royal, Bath and West, Royal Hackney or Royal Counties Show, to be driven in harness on the 3rd day of the Show	10	5	2
41.—MARE or GELDING, not exceeding 14.2 hands, to be ridden on the 3rd day of the Show	10	5	2
42.—HACK, 14 hands and not over 15.2, suitable for and to be ridden by a lady, on the 3rd day of the Show	10	5	2
43.—TANDEMS, MARES or GELDINGS, to be shown in Harness, on the 4th day of the Show	15	10	5
44.—Pairs of MARES or GELDINGS, to be shown in Harness on the 4th day of the Show	15	10	5
45.—MARE or GELDING, not over 14 hands, to be driven in harness on the 5th day of the Show	10	5	2

TRADESMEN'S CLASSES.

The First Prize in Class 47 is offered by the Plymouth Rotary Club. and the Prizes in Class 46 and the Second and Third Prizes in Class 47 are offered by the Plymouth Local Committee.

Class.		First Prize. £	Second Prize. £	Third Prize. £
46.	**—Light Mare or Gelding, the property of a Tradesman residing within a radius of four miles from the Guildhall, Plymouth, used solely by him for trade purposes for a period of not less than three months prior to June 1st, 1922, to be exhibited on the 5th day of the Show in the Trade Vehicle and Harness in which it has been worked for the same period .. ..**	10	4	2
47.	**—Cart Mare or Gelding, the property of a Tradesman residing, or haulier carrying on business within a radius of four miles from the Guildhall, Plymouth, ditto, ditto .. Silver Cup Value £10**	10	4	2

MEDAL.

Offered by the Hackney Horse Society.

(F) A Silver Medal for the best Mare or Gelding exhibited in Single Harness in Classes 35 to 47 subject to Conditions 50.

JUMPING.

The Society reserves the right to cancel the Classes for Jumping in the event of sufficient entries not being forthcoming. In such case notice will be given to Exhibitors and any Entry Fee paid will be returned.

(For Regulations as to Jumping Classes see Conditions 52).

Judge: G. GORDON, The Barn House, Sherborne.

Entry Fees: With Box, Members, 30/-; Non-Members, 60/- each entry; Without Box, Members, 5/-; Non-Members, 10/-.

ENTRIES CLOSE
With Boxes April 8, or at double fees, April 15.
Without Boxes —at 12 noon on the day preceding the competition.

Horses can be entered in as many Jumping Classes as they are eligible for on payment of the entry fee for each Class, and can take Second or Third Prize in each Class. but only one First Prize **on the first three days of the Show.** In the event of an animal which has already won a First Prize in the aforesaid Classes being again placed first, the Animal next in point of merit will, if eligible, succeed to the First Prize, and the Stewards reserve the right to amend the Awards correspondingly, and, if necessary, to proportionately reduce the amounts paid to the other Prize Winners in the Class. The award to two or more exhibits of an equal First will not debar such Animals from taking a First Prize in a later class.

Horses entered in the Jumping Classes **only,** and not having a box in the Yard, must be in the Show Yard by 1 p.m. **on** the day on which they compete and, with the consent of the Stewards, may leave the Yard as soon as the Class has been judged.

JUMPING—*continued.*

Class.	First Prize. £	Second Prize. £	Third Prize. £
48.—Mare or Gelding, any height, that shall jump over the course in the best form on the 1st day of the Show	10	5	2
49.—Mare or Gelding, under 14.2 hands, ditto, 1st day	10	5	2
50.—Mare or Gelding, 15 hands and over, that shall jump over the course in the best form on the 2nd day of the Show	10	5	2
51.—Mare or Gelding, under 15 hands, ditto, 2nd day	10	5	2
52.—Mare or Gelding, any height, that shall jump highest on the 3rd day of the Show	10	5	2
53.—Mare or Gelding, any height, that shall jump over the course in the best form on the 3rd day of the Show	10	5	2
Offered by J. F. Winnicott, Esq., Mayor of Plymouth.			
253.—Hunter Mare or Gelding, having competed in Classes 16 to 25 or 250 and 251, the property of a resident in Devon or Cornwall, points up to 50 per cent. of the total being given for the animal, and points up to 50 per cent. for jumping over the course, on the 3rd day of the Show Silver Cup, Value	**£21**		
54.—Mare or Gelding, 15 hands and over, that shall jump over the course in the best form on the 4th day of the Show	15	7	3
55.—Mare or Gelding, under 15 hands, ditto, 4th day	15	7	3
254.—Pony Mare or Gelding, not exceeding 14.2 hands, the property of a resident within 30 miles of Plymouth ,that shall jump over the course in the best form on the 4th day of the Show	**6**	**3**	**2**
255.—Pony Mare or Gelding, not exceeding 14.2 hands, the property of a resident within 30 miles of Plymouth, that shall jump over the course in the best form on the 5th day of the Show	**6**	**3**	**2**
56.—Mare or Gelding, any height, that shall jump highest on the 5th day of the Show	10	5	2
CHAMPION CLASS.			
57.—Mare or Gelding, any height, having won a Prize in Classes 48 to 56 that shall jump over the course in the best form on the 5th day of the Show	20	10	5

(In this Class the whole of the Jumps will be raised at the discretion of the Stewards).

CATTLE.

Entry Fees: Members, 20/-; Non-Members, 40/-, each entry.

DEVON.

Judge—R. BRUFORD, Nerrols, Taunton.

The Prizes in Class 58 and the First Prize in Class 59 are contributed by the Devon Cattle Breeders' Society.

Class.	First Prize. £	Second Prize. £	Third Prize. £
58.—Cow or Heifer, in-Milk, to be Milked in the Ring before judging, under Conditions No. 61	**10**	**5**	**2**
59.—Cow, in-Milk, calved before 1919	**10**	5	2
60.—Heifer, in-Milk, calved in 1919	10	5	2
61.—Heifer, calved in 1920	10	5	2
62.—Heifer, calved in 1921	10	5	2
63.—Bull, calved before 1920	10	5	2
64.—Bull, calved in 1920	10	5	2
65.—Bull, calved in 1921	10	5	2

CHAMPION PRIZE.

Offered by the Devon Cattle Breeders' Society.

Best Animal exhibited in Classes 58 to 65 .. .. .. **10**

CHALLENGE CUPS.

Offered through the Devon County Agricultural Association.

By. A. T. Loram, Esq., a Silver Challenge Cup, for the best Devon Dairy Cow in Class 58. To be won three times in succession or any four times, before becoming the absolute property of the winner.

By Major A. C. Morrison-Bell, M.P., a Silver Challenge Cup for the best Pedigree Devon Bull exhibited in Classes 63, 64 and 65. To be won by the Exhibitor three times in succession or any four times, before becoming the absolute property of the winner.

By J. Putnam, Esq., a 30-Guinea Challenge Cup for the best Group of Devon Cattle (one male and two females) exhibited in the Devon Classes. At least two of the Group must have been bred by the Exhibitor. To be won three times in succession, or any four times, before becoming the absolute property of the winner.

SOUTH DEVON.

Judge—J. L. HOSKING, Fentongollan, Probus, Cornwall.

£30 towards the Prizes in Classes 66 to 73 are contributed by the South Devon Herd Book Society.

Class.	First Prize. £	Second Prize. £	Third Prize. £
66.—Cow or Heifer, in-Milk, to be milked in the Ring before Judging, under Condition No. 61	**10**	**5**	**2**
67.—Cow, in-Milk, calved before 1919	**10**	**5**	2
68.—Heifer, in-Milk, calved in 1919	10	5	2
69.—Heifer, calved in 1920	10	5	2
70.—Heifer, calved in 1921	10	5	2
71.—Bull, calved before 1920	10	5	2
72.—Bull, calved in 1920	10	5	2
73.—Bull, calved in 1921	10	5	2

CATTLE—*continued.*

SOUTH DEVON—*continued.*

CHALLENGE CUPS.

Offered by the President (H.R.H. The Prince of Wales, K.G.).

A Silver Challenge Cup for the best Cow in-Milk in the South Devon Classes, to be won three times in succession or four times altogether before becoming the property of the Winner.

Offered through the Devon County Agricultural Association.

A Silver Challenge Cup, value 30 Guineas, presented by His Royal Highness the Prince of Wales, for the best Group of South Devon Cattle (one male and two females) exhibited in the South Devon Classes. At least two of the Group must have been bred by the Exhibitor. To be won three times in succession, or any four times, before becoming the absolute property of the winner.

By Percy Witton, Esq., a Silver Challenge Cup, for the best South Devon Dairy Cow in Class 66. To be won three times in succession or any four times, before becoming the absolute property of the winner.

By Major E. F. Morrison-Bell, a Silver Challenge Cup, for the best Pedigree South Devon Bull, exhibited in Classes 71, 72 and 73, to be won by the Exhibitor three times in succession or any four times, before becoming the absolute property of the winner.

A Silver Challenge Cup, value 30 Guineas, is offered by the South Devon Herd Book Society, for the best Cow or Heifer in the South Devon Herd Book, open only to Members of the South Devon Herd Book Society. The Cup to be won three times in succession, or any four times, before becoming the absolute property of the winner.

A Silver Cup, value 5 Guineas, by the "Western Morning News and Mercury," for the best Beast in the South Devon Classes, the owner to be a Member of the Devon Farmers' Union. To be won twice in succession, or any three times, before becoming the absolute property of the winner.

A Silver Cup, value £10, by Sir Henry Lopes, Bart., for the best Exhibit in Classes 69 and 70.

SHORTHORN.

Judge - W. GARNE, Ablington, Fairford, Glos.

CLASS.	First Prize. £	Second Prize. £	Third Prize. £
74.—COW, in-Milk, calved before 1919	10	5	2
75.—HEIFER, in-Milk, calved in 1919	10	5	2
76.—HEIFER, calved in 1920	10	5	2
77.—HEIFER, calved in 1921	10	5	2
78.—BULL, calved in 1918 or 1919	10	5	2
79.—BULL, calved in 1920	10	5	2
80.—BULL, calved in 1921	10	5	2

CHAMPION PRIZES.

Offered by the Shorthorn Society.

Best Bull in Classes 78 to 80 entered in, or eligible for entry in Coate's Herd Book, with Silver Medal to the Breeder 10

DAIRY SHORTHORN.

Judge—R. HOBBS, Kelmscott, Lechlade, Glos.

The First Prizes in Classes 81 and 82 (and a Silver Medal to the Breeder of the winners) are offered by the Shorthorn Society in conjunction with the Dairy Shorthorn Association, and the First Prize in Class 85 by the Dairy Shorthorn Association.

	First Prize. £	Second Prize. £	Third Prize. £
81.—Pedigree Cow, in-Milk, calved in or before 1918, eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society or Association in 1921, to be milked in the Ring before judging, under Conditions 61	10	5	2
82.—Ditto, calved in or after 1919, ditto, ditto	10	5	2

The Prizes in Class 83 are offered by Mr. E. Ezra, of Lock, Partridge Green, Sussex.

Class.

83.—Pedigree Heifer, calved in 1921, eligible for and entered in Coates's Herd Book or pedigree sent for such entry previous to the Show, subject to Conditions No. 62	**10**	**5**	**2**
84.—Pedigree Bull calved before 1921	10	5	2
85.—Pedigree Bull, calved in 1921, entered or pedigree accepted for entry in Coates's Herd Book, subject to Conditions No. 62	10	5	2

HEREFORD.

Judge—H. R. EVANS, Court of Noke, Pembridge, Hereford.

86.—Cow, in-Milk, calved before 1919	10	5	2
87.—Heifer, in-Milk, calved in 1919	10	5	2
88.—Heifer, calved in 1920	10	5	2
89.—Heifer, calved in 1921	10	5	2
90.—Bull, calved in 1918 or 1919	10	5	2
91.—Bull, calved in 1920	10	5	2
92.—Bull, calved in 1921	10	5	2

CHAMPION PRIZES.

Offered by the Hereford Herd Book Society.

Best registered Cow or Heifer in Classes 86 to 89	**10**		
Best registered Bull in Classes 90 to 92	**10**		

SUSSEX.

Judge—W. A. THORNTON, Daynton House, Kingsway, Hove, Sussex.

The Prizes in Class 93 and the Silver Medals are offered by the Sussex Herd Book Society.

93.—Cow or Heifer, in-Milk, calved in or before 1919 ..	**10**	**5**	**2**
94.—Heifer, calved in 1920 or 1921	10	5	2
95.—Bull, calved in 1919, 1920 or 1921	10	5	2

SILVER MEDALS.

Best Cow or Heifer in Class 93 or 94.

Best Bull in Class 95.

RED POLL.

Judge—S. WOODIWISS, Gravely, Great Waltham, Chelmsford.

£34 towards the Prizes in Classes 96 to 100 are contributed by the Red Poll Cattle Society.

	First Prize. £	Second Prize. £	Third Prize. £
96.—Cow or Heifer, in-milk, calved before 1920	**10**	**5**	**2**
97.—Heifer, calved in 1920	**10**	**5**	**2**
98.—Heifer, calved in 1921	10	5	2
99.—Bull, calved in or before 1920	10	5	2
100.—Bull, calved in 1921	10	5	2

ABERDEEN-ANGUS.

Judge—A. P. McLAREN, Aynho Warren, Banbury, Oxford.

The First Prize in Class 101 is offered by the English Aberdeen-Angus Cattle Association.

Class.			
101.—Cow or Heifer, in-Milk, calved before 1st December, 1920	**10**	5	2
102.—Heifer, calved on or after 1st December, 1920	10	5	2
103.—Bull, calved in 1919, 1920, or 1921	10	5	2

CHAMPION PRIZES.

Offered by the Aberdeen-Angus Cattle Society.

A Silver Medal for the best Animal in Classes 101 to 103.

Offered by the English Aberdeen-Angus Cattle Association.

A Silver Medal for the best Animal of opposite sex.

BRITISH FRIESIAN.

Judge—H. T. WILLETT, Monkton Parsonage, Ramsgate.

£30 towards the Prizes in Classes 104 to 108 are contributed by the British Friesian Cattle Society, and animals entered must be registered in the B.F.S. Herd Book proper, those registered in the Supplementary Section not being eligible.

104.—Cow or Heifer, any age, in-Milk	**10**	**5**	2
105.—Heifer, not in-Milk, calved in 1920	**10**	**5**	2
106.—Heifer, calved in 1921	10	5	2
107.—Bull, calved in or before 1920	10	5	2
108.—Bull, calved in 1921	10	5	2

JERSEY.

Judges—

Cows and Heifers—J. H. SHORE, Whatley Combe, near Frome, Somerset.

Bulls : H. B. NAPIER, Long Ashton, Bristol.

The Prizes in Class 109 are offered by the English Jersey Cattle Society.

109.—Cow or Heifer, in-Milk, entered in or eligible for entry in the English Jersey Herd Book, sired in Great Britain or Ireland	**5**	**3**	**2**
110.—Cow, in-Milk, calved before 1919	10	5	2
111.—Cow or Heifer, in-Milk, calved in 1919	10	5	2
112.—Heifer, in-Milk, calved in or since 1920	10	5	2
113.—Heifer, calved in 1921	10	5	2
114.—Bull, calved in 1918, 1919 or 1920	10	5	2
115.—Bull, calved in 1921	10	5	2

GUERNSEY.

Judge—G. E. de GARIS, St. Leddard's, Castel, Guernsey.

£20 towards the Prizes in the Guernsey Classes are contributed by the English Guernsey Cattle Society.

CLASS.	First Prize. £	Second Prize. £	Third Prize. £
116.—Cow in-Milk, calved before 1919	10	5	2
117.—HEIFER, in-Milk, calved in 1919	10	5	2
118.—HEIFER, calved in 1920	10	5	2
119.—HEIFER, calved in 1921	10	5	2
120.—BULL, calved in 1918 or 1919	10	5	2
121.—BULL, calved in 1920	10	5	2
122.—BULL, calved in 1921	10	5	2

CHALLENGE CUP.

Offered through the English Guernsey Cattle Society by Captain G. H. Johnstone.

The "Trewithen Challenge Cup" for the best Bull exhibited in Classes 120 to 122 whose dam and sire's dam have qualified in accordance with the standard required for entry in the Milk Records of the English Guernsey Cattle Society, both in milk and butter-fat, or alternately in either milk or butter fat with 30 per cent. above the requirements for entry. Only the official test of the F.G.C.S., R.G.A.S., or the Ministry of Agriculture will be accepted.

The Cup to be won three years in succession by the same exhibitor before becoming his absolute property.

DEXTER.

Judge—Col. W. STALLARD, St. John's House, Worcester.

CLASS.	First Prize. £	Second Prize. £	Third Prize. £
123.—Cow or HEIFER, in-Milk, calved in or before 1919 ..	10	5	2
124.—HEIFER, calved in 1920 or 1921	10	5	2
125.—BULL, calved in 1919, 1920 or 1921	10	5	2

The Prizes in Class 126 are offered by the English Kerry and Dexter Cattle Society.

CLASS.	First Prize. £	Second Prize. £	Third Prize. £
126.—Bull, calved in 1921, whose sire and dam are entered in the English Kerry and Dexter or Royal Dublin Society's Herd Book	**10**	**3**	**2**

SPECIAL PRIZE.

Offered by the English Kerry and Dexter Cattle Society.

The Devonshire Challenge Cup, for the Best Animal in Classes 123 to 126, bred by Exhibitor, and entered in or eligible for the English Kerry and Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.

The Certificate of Award of the English Kerry and Dexter Cattle Society will be given to the owner of the winning animal on each occasion the Cup is competed for.

MILK TEST.

(See Regulation 64).

Animals entered in the Breed Classes can, if eligible, be entered also, on payment of an additional fee of 10/- *for Members and* 20/- *for Non-Members, in Classes* 127 *to* 131.

CLASS.	First Prize. £	Second Prize. £	Third Prize. £
127.—Cow, in-Milk, of any breed or cross, under 950lbs. live weight, yielding the largest quantity of milk, of normal character, containing at each time of milking, 12 per cent. of total solids, of which not less than 3 per cent. shall be fat, the period of lactation being taken into consideration ..	10	5	2
128.—Cow, in-Milk, of any breed or cross, 950lbs. live weight or over, ditto, ditto	10	5	2
129.—RED POLL COW or HEIFER, ditto, ditto	10	5	2

SPECIAL PRIZES.

Offered by the English Kerry and Dexter Cattle Society.

Gold, Silver and Bronze Medals for the three best Dexter Cows competing in Classes 127 and 128.

BUTTER TEST.

(See Regulation 64.)

Judge—A. F. SOMERVILLE, Dinder House, Wells, Somt.

The Prizes in Class 130 are offered by the English Jersey Cattle Society, and in Class 131 by the English Guernsey Cattle Society, and entries in them are subject to any conditions issued by these Societies previous to the tests.

CLASS.	First Prize.	Second Prize.	Third Prize.
130.—Cow, eligible for or entered in the English Jersey Herd Book, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Jersey Cattle Society	Gold Medal or 10	Silver Medal.	Bronze Medal.

Certificates of Merit will also be awarded to Cows under 5 years old obtaining 30 points, and to Cows 5 years old or over obtaining 35 points.

Judge—J. W. ASHBY, 12, Hanover Square, London, W.

CLASS.	First Prize. £	Second Prize. £	Third Prize. £
131.—Cow, eligible for or entered in the English Guernsey Herd Book, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Guernsey Cattle Society	5	3	2

SHEEP.

Entry Fees : Members, 20/- ; Non-Members, 40/- each entry.

DEVON LONGWOOLLED.

Judge—J. H. GIBBINGS, Week, North Tawton, Devon.

Class		First Prize. £	Second Prize. £	Third Prize. £
132.	—Ram, Two-shear and upwards	7	4	2
133.	—Shearling Ram	10	5	2
134.	—Pair of Ram Lambs, dropped in 1922	7	4	2
135.	—Pen of three Shearling Ewes	10	5	2
136.	—Pen of 3 Ewe Lambs, dropped in 1922	7	4	2

SOUTH DEVON.

Judge—J. HOARE, Mount Barton, Staverton, Totnes.

The First Prize in Class 137 is contributed by the South Devon Flock Book Association.

137.	**—Ram, two-shear and upwards**	**10**	5	2
138.	—Shearling Ram	10	5	2
139.	—Pair of Ram Lambs, dropped in 1922	7	4	2
140.	—Pen of three Shearling Ewes	10	5	2
141.	—Pen of three Ewe Lambs, dropped in 1922	7	4	2

CHALLENGE CUP.

Offered by a Devonian through the South Devon Flock Book Association in conjunction with the Devon County Agricultural Association.

A Silver Challenge Cup, value £21, for the best registered Ram in the South Devon Classes. The Cup to be won by the same exhibitor three times in succession or four times at intervals before becoming his absolute property.

KENT OR ROMNEY MARSH.

Judge—R. H. GREEN, Estate Office, Willesborough, Kent.

The Prizes in Class 142 are offered by the Kent or Romney Marsh Sheep Breeders' Association.

142.	**—Two Shear Ram**	**10**	**5**	**2**
143.	—Shearling Ram	10	5	2
144.	—Pair of Ram Lambs, dropped in 1922	10	5	2
145.	—Pen of three Shearling Ewes	10	5	2

SOUTHDOWN.

Judge—J. B. TRIBE, Cobbett House, Pulborough, Sussex.

The Prizes in Class 146 and the Silver Medal are offered by the Southdown Sheep Society, subject to there being at least three competitors for the prizes.

146.	**—Two Shear Ram**	**10**	**5**	**2**
147.	—Shearling Ram	10	5	2
148.	—Pair of Ram Lambs, dropped in 1922	10	5	2
149.	—Pen of three Shearling Ewes	10	5	2

SPECIAL PRIZE.

Offered by the Southdown Sheep Society, under Condition 67.

Silver Medal or £1 for the best Ram or Ram Lamb in Classes 146, 147

HAMPSHIRE DOWN.

Judge—B. J. WATERS, Bishopstone, Salisbury.

The Prizes in Class 151 and the Champion Prize are offered by the Hampshire Down Sheep Breeders' Association.

Class	First Prize. £	Second Prize. £	Third Prize. £
150.—Shearling Ram	10	5	2
151.—Ram Lamb, dropped in 1922	**7**	**5**	**3**
152.—Pair of Ram Lambs, dropped in 1922	10	5	2
153.—Pen of three Shearling Ewes	10	5	2

CHAMPION PRIZE.

Best Pen of Lambs in Classes 151 and 152	**5**		

(Single Ram Lamb to constitute a Pen).

OXFORD DOWN.

Judge—W. D. LITTLE, Middleton Stoney, Bicester, Oxon.

154.—Shearling Ram	10	5	2
155.—Pair of Ram Lambs, dropped in 1922	10	5	2
156.—Pen of three Shearling Ewes	10	5	2

The Prizes in Class 157 are offered by the Oxford Down Sheep Breeders' Association, and will be withheld until the Animals awarded the Prizes are registered in the Flock Book.

157.—Pair of Ewe Lambs, dropped in 1922	**6**	**3**	**1**

DORSET HORN.

Judge—L. C. ATTRILL, Bathingbourne, Sandown, Isle of Wight.

(The Animals entered in Classes 158 and 160 must have been shorn bare in the year of the Show

158.—Shearling Ram	10	5	2
159.—Pair of Ram Lambs, dropped after November 1st, 1921	10	5	2
160.—Pen of three Shearling Ewes	10	5	2

The Prizes in Class 161 are offered by the Dorset Horn Sheep Breeders' Association.

161.—Pen of three Ewe Lambs, dropped after November 1st, 1921	**10**	**5**	**2**

DORSET DOWN.

Judge—H. R. WATSON, Milborne Wick, Sherborne.

The Prizes in Class 162 are offered by the Dorset Down Sheep Breeders' Association.

162.—Shearling Ram	**10**	**3**	**2**
163.—Pair of Ram Lambs, dropped in 1922	10	5	2
164.—Pen of three Shearling Ewes	10	5	2

EXMOOR HORN.

Judge—T. C. PEARCE, Leigh, Dulverton.

The First Prize in Class 165 is offered by the Exmoor Horn Sheep Breeders' Society.

	First Prize. £	Second Prize. £	Third Prize. £
165.—Ram, two shear and upwards	**10**	5	2
166.—Shearling RAM	**10**	5	2
167.—Pair of RAM LAMBS, dropped in 1922	7	4	2
168.—Pen of three Shearling EWES	10	5	2
169.—Pen of three EWE LAMBS, dropped in 1922	7	4	2

DARTMOOR.

Judge—J. J. NICKELS, Rushford, Chagford.

£10 towards the prizes in Classes 170 to 174 are offered by the Dartmoor Sheep Breeders' and Flock Book Association.

CLASS.

170.—RAM, two shear and upwards, shown out of wool	10	5	2
171.—Shearling RAM, shown out of wool	10	5	2
172.—Pair of RAM LAMBS, dropped in 1922, shown in wool	7	4	2
173.—Pen of three SHEARLING EWES, shown in wool	10	5	2
174.—Pen of three EWE LAMBS, dropped in 1922, shown in wool	7	4	2

SPECIAL PRIZES.

Offered by Col. G. Craven Hoyle and the Plymouth Local Committee.

For the three best Animals in Classes 170 to 174, that had not won a Prize previous to June 1st, 1922, the property of a resident within 30 miles of Plymouth — First Prize, Silver Cup, value £5 5s. Second, £3. Third, £2.

SUFFOLK.

Judge—D. A. Green, East Donyland Hall, Colchester.

£25 towards the Prizes in Classes 175 to 177 are contributed by the Suffolk Sheep Society.

175.—Shearling RAM	**10**	**5**	2
176.—Pair of RAM LAMBS dropped in 1922	**10**	5	2
177.—Pen of three EWE LAMBS dropped in 1922	10	5	2

RYELAND.

Judge—T. E. DAVIES, Green Farm, Tidmarsh, Reading.

£15 of the Prizes in Classes 178 to 180 are offered by the Ryeland Sheep Society.

178.—Shearling RAM	7	4	2
179.—Pair of RAM LAMBS, dropped in 1922	7	4	2
180.—Pen of three Shearling EWES	7	4	2

GOATS.

(For Regulations see Entry Forms).

Entry Fees : Members, 7/6 ; Non-Members 10/- each entry.

Judge—H. S. HOLMES PEGLER, Coombe Bury House, Kingston Hill, Surrey.

£16 7s. 6d. towards the Prizes in Classes 181 to 187 and the Special Prizes are contributed through the British Goat Society.

Class	First Prize £	Second Prize £	Third Prize s.
181.—Female Goat. Swiss, including Toggenburg, Anglo-Swiss, British Alpine, British Saanen or British Toggenburg, over 2 years	2 10	1 10	15/-
182.—Female Goat. Anglo-Nubian, and any other variety not included in Class 181, over two years	2 10	1 10	15/-
183.—Goatling. Any variety, over 1 year, but not exceeding two years	2 10	1 10	15/-
184.—Female Kid. Any Variety	2 0	1 10	15/-
185.—Male Goat. Any variety, over two years ..	2 10	1 10	15/-
186.—Male Goat. Any variety, over one but not exceeding two years..	2 10	1 10	15/-
187.—Milking Competition for Goats. Any variety	2 10	1 10	15/-

The Prizes awarded at this Show will also be included in the awards for the British Goat Society "Breeders' Perpetual Challenge Cup."

SPECIAL PRIZES.

For Animals entered in Classes 181 to 187 :—

Challenge Certificate for the best Female Goat that has borne a kid.

Challenge Certificate for the best Dual Purpose Goat.

Challenge Certificate for the best Male Goat over 1 year.

PIGS:

Entry Fees : Members, 20/- ; Non-Members, 40/- each entry.

BERKSHIRE.

Judge—J. FRICKER, Marsh Farm, Stalbridge, Dorset.

£4 towards the Prizes in Classes 188 to 191 are contributed by the British Berkshire Society.

Class.	First Prize. £	Second Prize. £	Third Prize. £
188.—Boar, exceeding 18 months old	7	3	2
189.—Boar, not exceeding 18 months old	5	2	1
190.—Breeding Sow, exceeding 18 months old.. ..	7	3	2
191.—Pair of Breeding Sows, not exceeding 18 months old	5	2	1

SPECIAL PRIZE.

Offered by the British Berkshire Society.

	First Prize. £	Second Prize. £	Third Prize. £
Best Boar or Sow in the Berkshire Classes entered in, or eligible for, the Herd Book, whose Sire and Dam, together with the name of its Breeder, are entered in the Catalogue	5		

A Silver Medal will be awarded to the Breeder of the prize-winning Animal.

LARGE BLACK.

Judge—G. A. GOODCHILD, Oak House, Great Yeldham, Essex.

£40 towards the prizes in the Large Black Classes and the Champion Prizes are contributed by the Large Black Pig Society.

Class.	First Prize. £	Second Prize. £	Third Prize. £
192.—Boar, farrowed before May 1, 1921	7	5	2
193.—Boar, not exceeding 12 months old on May 1, 1922	7	5	2
194.—Boar, farrowed, in 1922	7	3	2
195.—Breeding Sow, farrowed before May 1, 1921 ..	7	5	2
196.—Breeding Sow, not exceeding 12 months old on May 1, 1922	7	5	2
197.—Pair of Breeding Sows, farrowed in 1922 ..	7	3	2

CHAMPION PRIZES.

	First Prize. £	Second Prize. £	Third Prize. £
Best Animal in Classes 192 to 194	5		
Best Animal in Classes 195 to 197	5		

LARGE WHITE.

Judge—C. SPENCER, Milpond, Little Oakley, Harwich.

£10 towards the prizes in Classes 198 to 201 and the Champion Prizes are offered by the National Pig Breeders' Association.

CLASS.	First Prize. £	Second Prize. £	Third Prize. £
198.—BOAR, farrowed in 1919, 1920 or 1921	7	3	2
199.—Pair of BOARS, farrowed in 1922	5	2	1
200.—BREEDING SOW, farrowed before 1922	7	3	2
201.—Pair of BREEDING SOWS, farrowed in 1922	5	2	1

CHAMPION PRIZES.

A GOLD MEDAL or £5, for the Best Boar in Class 198 or 199.

A GOLD MEDAL or £5, for the Best Sow in Class 200 or 201.

MIDDLE WHITE.

Judge—C. SPENCER, Milpond, Little Oakley, Harwich.

£10 towards the prizes in Classes 202 to 205 and the Champion Prizes are offered by the National Pig Breeders' Association.

CLASS.	First Prize. £	Second Prize. £	Third Prize. £
202.—BOAR, farrowed in 1919, 1920 or 1921	7	3	2
203.—Pair of BOARS, farrowed in 1922	5	2	1
204.—Breeding Sow, farrowed before 1922	7	3	2
205.—Pair of Breeding Sows, farrowed in 1922	5	2	1

CHAMPION PRIZES.

A GOLD MEDAL or £5, for the Best Boar in Class 202 or 203.

A GOLD MEDAL or £5, for the Best Sow in Class 204 or 205.

LONG WHITE LOP-EARED.

Judge—W. MASHFORD, Lane End, Quither, Milton Abbot, Tavistock.

£20 towards the prizes in Classes 206 to 210 are contributed by the Long White Lop-eared Pig Society.

CLASS.	First Prize. £	Second Prize. £	Third Prize. £
206.—BOAR, farrowed on or before October 1, 1921	7	3	2
207.—BOAR, farrowed since October 1, 1921	7	3	2
208.—Sow, any age, in-farrow or with farrow not exceeding 8 weeks old on June 1, 1922	7	3	2
209.—Sow, farrowed since March 1, 1921	7	3	2
210.—Pair of Sows, farrowed in 1922	5	2	1

SPECIAL PRIZES.

Offered by Col. G. Craven Hoyle and the Plymouth Local Committee.

For the three best Animals in Classes 206 to 210 that have not won a prize previous to June 1st, 1922, the property of a resident within 30 miles of Plymouth - First Prize, Silver Cup, value £5 5s.. Second £3 Third, £2.

GLOUCESTERSHIRE OLD SPOTS.

Judge—A. T. PRICE, Blackhall, Berkeley, Glos.

£20 towards the Prizes in Classes 211 to 214 are contributed by the Gloucestershire Old Spots Pig Society.

Class.	First Prize. £	Second Prize. £	Third Prize. £
211.—Boar, farrowed in 1919, 1920 or 1921	7	3	2
212.—Pair of Boars, farrowed in 1922	5	2	1
213.—Breeding Sow, farrowed before 1921	7	3	2
214.—Pair of Breeding Sows, farrowed in 1922 ..	5	2	1

CHAMPION PRIZES.

Offered by the Gloucestershire Old Spots Pig Society.

The Sir George Watson Challenge Cup, value £21, for the best Animal in Classes 211 to 214. (The Cup to be won three times by the same Exhibitor with different animals before becoming his own property).

The Deane-Drummond Cup, value £14 14s. for the best Boar in Classes 211 and 212.

The Hiatt-Baker Cup for the best Sow in Classes 213 and 214.

(The "Deane-Drummond" and "Hiatt-Baker" Cup to be won twice by the same exhibitor with different animals before becoming his own property.

WESSEX SADDLEBACK.

Judge—L. L. BATTEN, Fighting Cocks Farm, Ower, Romsey.

£30 towards the Prizes in Classes 215 to 220 and the Champion Prizes are offered by the Wessex Saddleback Pig Society, and all pigs exhibited must be entered or eligible for entry in that Society's Herd Book.

215.—Boar, farrowed in 1920	6	3	2
216.—Boar, farrowed in 1921	6	3	2
217.—Boar, farrowed in 1922	5	2	1
218.—Breeding Sow, farrowed in 1919 or 1920 ..	6	3	2
219.—Breeding Sow, farrowed in 1921	6	3	2
220.—Pair of Breeding Sows, farrowed in 1922	5	2	1

GOLD MEDAL.

Value £5 5s. for the best Pig exhibited in Classes 215 to 220, and a Silver Medal to the Breeder who is not the exhibitor of the Animal winning the Gold Medal.

PRODUCE.

CIDER.

(Open to Growers or Makers).

Entry Fees: Members, 3/6; Non-Members, 6/- each entry.

Judge—G. H. HOLLINGSWORTH, Shire Hall, Gloucester.

Class	First Prize £	Second Prize £	Third Prize £
221.—Cask of not less than 9 and not more than 30 gallons of Cider, made in 1921, of a specific gravity not exceeding 1.015 at 60 deg. Fahr.	3	2	1
222.—12 Quart Bottles of Cider, made in 1921, ditto ..	3	2	1
223.—Cask of not less than 9 and not more than 30 gallons of Cider, made in 1921	3	2	1
224.—12 Quart Bottles of Cider, made in 1921	3	2	1
225.—12 Quart Bottles of Cider, made in any year previous to 1921	3	2	1

CHEESE.

Entry Fees: Class 226. Members, 10/-; Non-Members, 20/-. Classes 227 to 229: Members, 7/6; Non-Members, 15/-

Judge—W. A. TITLEY, 55, Victoria Street, Bristol.

	First Prize. £ s	Second Prize £ s	Third Prize. £ s	Fourth Prize. £ s.
226.—Three Cheddar Cheeses (not less than 56lbs each) made in 1921	10 0	7 0	4 0	
227.—Three Cheddar Cheeses (not over 56lbs. each), made in 1921	8 0	5 0	3 0	
228.—Four Loaf or other Truckle Cheeses, made in 1921	5 0	3 0	2 0	
229.—Three Caerphilly Cheeses, made in 1922	5 0	3 0	2 0	

CREAM CHEESE, BUTTER AND CREAM.

(*These Classes are not open to Professional Teachers*)

Entry Fees: Class 233, 3/6; Other Classes—Members, 3/6; Non-Members, 6/-.

Judge—Mrs. STEVENS, Ditchford Farm, Moreton-in-Marsh, Glos.

	First Prize. £ s	Second Prize £ s	Third Prize. £ s	Fourth Prize. £ s.
230.—Three Cream or other Soft Cheeses ..	3 0	2 0	1 0	0 10
231.—2lbs. of Fresh (or very slightly salted) Butter	4 0	3 0	2 0	1 0

CREAM CHEESE, BUTTER AND CREAM —*continued.*

Class.	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.	Fourth Prize: £	s
232.—2lbs. of Butter, in the making of which no salt has been used, to be judged on the last day of the Show	4	0	3	0	2	0	1	0

The Prizes in Class 233 are offered by the Trustees of "The John Boscawen Prize Fund," Cornwall.

Class.	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.	Fourth Prize: £	s
233.—2lbs. of Butter, made from Scalded Cream by a Student of the Cornwall County Dairy School	**3**		**2**		**1**			
234.—12lbs. of Keeping Butter, in a jar or crock, to be delivered to the Secretary 4 weeks before the Show	5	0	4	0	3	0	2	0
235.—Four half-pounds of Scalded Cream ..	3	0	2	0	1	0		

The Prizes in Classes 256 to 258 are offered by the Plymouth Local Committee.

Class.	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.	Fourth Prize: £	s
256.—2lbs. of Butter, made by a resident within a radius of 30 miles from Plymouth .	**3**	**0**	**2**	**0**	**1**	**0**		
257.—2lbs. of Butter made up into not more than four ornamental designs for the table, made by a resident within a radius of 30 miles from Plymouth	**3**	**0**	**2**	**0**	**1**	**0**		
258.—2lbs. of Scalded Cream, made by a resident within a radius of 30 miles from Plymouth	**3**	**0**	**2**	**0**	**1**	**0**		

COMPETITIONS.

BUTTER-MAKING.

(*No Winner of a first prize given by this Society for Butter-making during the last* 3 *years is eligible to compete in Class* 237 *or* 238.)

Entry Fees: Classes 236, 259 and 260, 3/6 each entry. Classes 237 to 240, Members, 3/6; Non-Members, 6/-.

Judge—Mrs. STEVENS, Ditchford Farm, Moreton-in-Marsh, Glos.

(*For Conditions and Regulations see Entry Form.*)

Class.	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.	Fourth Prize. £	s.
236.—For Children under 14 years of age, attending School. On the 1st day of the Show	3	0	2	0	1	0	0	10
237.—For Men and Women, bona fide workers on a farm. On the 2nd day of the Show	4	0	3	0	1	10	1	0
238.—For Students who have been through a course of instruction in Butter-making at any County Council School, and who have not previously won a first or second prize at one of the Society's Shows. On the third day of the Show	4	0	3	0	1	10	1	0

The Prizes in Classes 259 and 260 are offered by the Devon County Agricultural Committee, and are confined to pupils who have attended Classes held by the Devon County Council.

Class.	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.	Fourth Prize. £	s.
259.—For Boys and Girls under 15 years of age, on the 3rd say of the Show	**2**	**0**	**1**	**10**	**1**	**0**	**0**	**10**
239.—For Men and Women. On the 4th day of the Show	4	0	3	0	1	10	1	0
260.—For Men and Women, on the 4th day of the Show	**3**	**0**	**2**	**0**	**1**	**0**	**0**	**10**
240.—For Winners of First and Second Prizes in the Butter-making Classes 236 to 239 and 259 and 260, or at any previous meeting of the Society. On the 5th day of the Show.								

1st Prize, Gold Medal.
2nd ,, Silver Medal.
3rd ,, Bronze Medal.

MILKING.

Entry Fees: 2/6 each entry.

Judge—W. J. H. PORTER, Glendale, Wedmore, Somerset.

Class.	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.	Fourth Prize. £	s.
241.—For Men, 16 years of age and over ..	1	10	1	0	0	15	0	10
242.—For Women, 16 years of age and over ..	1	10	1	0	0	15	0	10
243.—For Boys and Girls under 16 years of age ..	1	10	1	0	0	15	0	10

CHAMPION PRIZES.

Offered by G. J. L. Lang, Esq., J.P., Saltash.

	£	s.
For the best Milker in Classes 241 and 242 ..	**1**	**1**
For the best Milker in Class 243	**1**	**1**

SHOEING.

Judge—J. R. R. COLEMAN, M.R.C.V.S., The Limes, Croft Road, Swindon.

Entry Fees: Members, 3/6; Non-Members, 6/- each entry.

The Prizes in Classes 261 and 262 are offered by the Devon County Agricultural Committee and are confined to men who have attended Classes under the Devon County Council.

Class.	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.	Fourth Prize. £	s.
244.—For Cart Horse Shoeing, by Smiths who have not previously won the First Prize in a corresponding Class at one of the Society's Meetings, or a Championship Prize at any National or County Agricultural Society's Show. On the 2nd day of the Show	4	0	3	0	2	0	1	0
261.—For Cart Horse Shoeing, by Smiths under 25 years of age. On the 2nd day of the Show	**4**	**0**	**3**	**0**	**2**	**0**	**1**	**0**
245.—For Nag Horse Shoeing, by Smiths who have not previously won the First Prize in a corresponding class or a Championship prize at any National or County Agricultural Society's Show. On the 3rd day of the Show	4	0	3	0	2	0	1	0
262. - For Nag Horse Shoeing, by Smiths over 25 years of age. On the 3rd day of the Show	**4**	**0**	**3**	**0**	**2**	**0**	**1**	**0**
246.—Champion Class. For Nag Horse Shoeing by previous winners of a First Prize at the Society's Show or a Championship Prize at any National or County Agricultural Society's Show. On the 4th day of the Show	4	0	3	0	2	0	1	0
247.—For Shoe Making or Turning, by Smiths, the patterns and descriptions of the Shoes to be supplied by the Judge. On the 4th day of the Show	4	0	3	0	1	0	0	10

CONDITIONS AND REGULATIONS FOR LIVE STOCK.

GENERAL.

Entries.

1. The following are the Fees payable for Stock entries made on or before April 8. After that date and up to April 15, entries (except in the Harness, Saddle and Jumping Classes) will only be received on payment, in each case, of double the fee named below. *Exhibitors are requested to note that no exception can be made to this.* The entry fee is not returnable to an Exhibitor who enters an Animal in a Class for which it is ineligible, or for entries that are withdrawn after the date of entry has expired.

		MEMBERS. (see Reg. 5 below)	NON-MEMBERS.
Horses (see also Reg. 2 below) including Horse Box ..	for each Entry, ...	30s.	.. 60s.
Harness, Saddle and Jumping, without box	for each Entry, ...	5s.	.. 10s.
Cattle, Sheep and Pigs	for each Entry	20s.	.. 40s.
Goats	for each Entry	7s. 6d.	.. 10s.

For particulars as to fees in the Produce, Butter-Making, Milking, Shoeing and Poultry Classes, see Entry forms.

2. Animals entered in the Harness, Saddle and Jumping Classes, and not having a box in the Yard, must be in the Yard by the time stated on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as they have been judged. Entries in these Classes, if no Horse Box is required, must reach the Secretary not later than 5 p.m. on the day previous to the competition for which the animal is entered. If a Box is required the entry must reach the Secretary on or before April 8, or at double fees as stated above, by April 15.

3. No Exhibitor can make more than three entries in any one Class of Horses, Cattle, Sheep, Goats or Pigs, except in the Harness, Saddle or Jumping Classes.

4. No Entry will be received unless the fee accompanies it, and (if the Exhibitor is a Member of the Society) the subscription for the year, unless previously paid, together with any arrears that may be due.

5. The privilege of entering at Members' fees is strictly limited to members of the Society, or of the Devon County Agricultural Association, elected on or before January 31, 1922, and subscribing not less than £1 annually, or if elected after that date who has paid his subscription for 1922 and an additional £1 before the date of the closing of entries.

6. Where a Prize is offered for a *pair or pen* of Animals, single entry fees only are payable for each *pair or pen*, and only one entry form must be used.

7. All Entries must be made on the printed forms to be obtained of the Secretary (F. Holland Storr, 3, Pierrepont Street, Bath), and, in applying for Forms, Exhibitors are requested to state how many entries they wish to make of either Horses, Cattle, Sheep, Goats or Pigs, as each Stock entry must be made on a separate form.

8. Every Exhibitor or Competitor is requested to carefully examine the List of Prizes and Conditions, as he will be held responsible for the correctness of his Certificate of Entry. An Exhibitor omitting to give information asked for on the

entry form, with regard to the age, breeder, name, colour, sire, dam, &c., of an animal will be liable to have his entry disqualified, and if an exhibitor desires that his animal shall compete for any special prize offered, he must notify this on the entry form where requested to do so.

9. If an Exhibitor or Competitor fails, when called upon by the Stewards or Council, to prove the correctness of his Certificate of Entry to their satisfaction, the Entry may be disqualified and any award made to it cancelled.

10. An Exhibitor who has made, in due time, an entry of Horses, Cattle, Sheep, Goats or Pigs, in a particular class, will be permitted, up to Wednesday, April 26, to withdraw the entry of such animal, and to substitute for it the entry of another animal in the same class, on payment of the difference, if any, between the amount of the entry fee originally paid for the animal withdrawn, and the post entry fee. When, after entry, an animal dies, the exhibitor will be permitted to substitute another entry for it, in the same class, without payment of any further fee, upon affording evidence of death and furnishing particulars of the substituted entry in time for the alteration to be made in the published catalogue.

11. An animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of Special or Champion Prizes for exhibits already entered in any particular Class.

12. Every exhibit must be the *bona fide* property of the Exhibitor both at the time of entry and on the first day of the Exhibition. For the purposes of this Meeting H.M. Officer's chargers will be considered as the property of the Officer in Classes 36, 39, 41, 48 to 57 and 253 to 255.

SHOW YARD.

13. The Yard will be open for the reception of Horses (see Regulation 2 for Harness, Saddle and Jumping Horses), Cattle, Sheep, Goats and Pigs, on Tuesday and Wednesday, May 30 and 31, from 7 a.m. to 6 p.m. Agricultural Horses and Hunters will also be received from 6 to 8 o'clock on the morning of the first day of Show, but all other Stock Entries (except Ponies, which must be in the Yard before 8 a.m. on Monday, June 5), must be in the Yard the previous day. A label denoting the number of each entry will be sent by the Secretary, and must be securely affixed to the head of the Animal The carriage of exhibits must in all cases be paid by the Exhibitor. No exhibit subject to charges will be received by the Officers of the Society.

14. If an animal is brought into the Show Yard without having been entered for exhibition, the owner shall be liable to a fine of £2 and to the forfeiture of any prize awarded to him or her.

15. All Live Stock (see Conditions 2, 13 and 38 for exceptions with regard to Horses) must remain in their places in the Show Yard until after six o'clock in the afternoon of the last day of the Show, and shall under no circumstances be taken out of their places in the interval without the special permission of the Stewards.

16. During the time the Show is open to the public no rug or cloth shall be hung up so as to conceal any animal in a horse-box or stall, except with the special permission of the Steward of the department. All sheets used for the purpose must be removed before 9 o'clock on each day the exhibition is open to the public, and must not be replaced until after the closing hour of the Show each day.

17. All Exhibits and all persons in charge of the same, will be subject to the Orders, Regulations, and Rules of the Society, and the Stewards shall have the power to remove from the Yard the Stock or property belonging to, and to cancel the admission ticket of, any Exhibitor who shall infringe any of the Regulations or Conditions of the Meeting, or who shall refuse to comply with any instructions given by the Stewards, without any responsibility attaching to the Stewards or the Society in consequence of such removal.

18. No animal shall be decorated with colours other than the Society's Prize Rosettes.

19. No person shall be allowed to fix any placard, or to take down any official placard, in the Yard, without the written permission of the Stewards.

20. All persons in charge of Exhibits will be subject to the orders of the Stewards, and will be required to parade or exhibit the animals in their charge at such times as may be directed by the Stewards. Servants must be in attendance each day during the Show at least a quarter of an hour before the time appointed for exhibiting the animals under their charge in the Show rings. Servants in charge of animals must see that the animals' boxes or stalls are kept clean. No oil or cooking stove of any description must be lighted in the Horse Boxes and any one found offending in this respect will be dealt with in accordance with Regulation 33. Owners of animals exhibited will be held responsible for the behaviour of their Servants, and for the consequences of any misconduct of such Servants.

21. Servants in charge of Stock at night must, if they leave the yard, return before 10 p.m., or they will not be admitted

22. On the day previous to the opening and on each day of the Show hay or green food and straw will be supplied by the Society free of expense to exhibitors at the Forage Stores in the Show Yard. Servants must apply at the Forage Stores for their Forage Tickets after they have brought their animals into the Yard. Corn, meal, and cake can be obtained in the Show Yard at fixed prices.

NOTE.—For the convenience of Exhibitors wishing to sell their animals, a Register will be kept at the Secretary's Office, in which they may enter the prices.

TICKETS.

23. Each Exhibitor of Live Stock whose entry fees amount to £1 and upwards will have a Free Ticket of admission to the Show Yard sent to him, except in the case of a Member, who will receive his Member's Badge in lieu of an Exhibitor's Ticket. Tickets for the use of Servants in charge of Live Stock remaining in the Yard will also be sent, and the Exhibitor will be held responsible for the proper use of such Tickets. In the case of animals not having a box in the Yard, a Servant's Ticket will not be required as the official label will admit the Driver or Rider, Horse and Vehicle into the Yard. In case of transfer or other improper use of a Ticket the Exhibitor will be required to pay a fine of £1 for each case. Exhibitors will be held responsible for the attendance at each Parade of as many Servants as Tickets have been issued for.

RESPONSIBILITY.

24. Neither the Society nor any of its Officers or Servants shall be in any way responsible or accountable for anything that may happen (from any cause or circumstance whatever) to Exhibitors or their Servants, or to any animal or article exhibited, or property brought into the Show Yard, or otherwise for anything else in connection with, or arising out of, or attributable to, the Society's Show, or these or any other Conditions or Regulations prescribed by the Society in relation thereto.

25. Each Exhibitor shall be solely responsible for any consequential or other loss, injury, or damage done to, or occasioned by, or arising from, any animal or article exhibited by him, and shall indemnify the Society against all legal or other proceedings in regard thereto.

26. The Society, its Officers and Servants, will not be liable for any errors or mistakes that may happen in placing or penning the Stock or Articles to be exhibited, but the Servants in charge of the same must see that they are placed or penned according to their entries.

DISQUALIFICATION.

27. The use of resin, soap, sawdust above the knee, or other substances designed to give an artificial appearance; cording; or any other improper means adopted in showing an animal in the Agricultural Horse Classes will be regarded as a disqualification.

28. No animal which has been exhibited as Fat Stock at any Show shall be eligible to compete for the Prizes offered in this Prize Sheet.

29. An animal having any unsoundness likely to be transmitted to its progeny shall be disqualified thereby from receiving any Prize offered by or through the Society.

30. If it shall be proved to the satisfaction of the Stewards or Council that an Exhibitor or Competitor has knowingly signed an incorrect Certificate, or knowingly given an incorrect Pedigree of any animal, or has attempted to enter an animal or other exhibit or to obtain a Prize by any other unfair means at this or any other Agricultural Society's Meetings, or is under exclusion from any Breed Society for fraudulent practices, the Council shall have the power to cancel all awards made to such Exhibitor or Competitor, to disqualify him or her from exhibiting or competing at future Meetings of the Society, and to inform other Agricultural Associations of their action in this respect.

PENALTIES.

31. As the non-exhibition of animals entered for the Show causes unnecessary preparations and expense, and disarranges the Show Yard, any person entering Stock, and failing to exhibit the same, shall pay a penalty of 10s. for each entry, unless a Certificate, under the hand of the Exhibitor or his authorised agent, be lodged with the Secretary of the Society, before the day of exhibition, certifying that such non-exhibition is caused either by—(1) the death of the animal or animals; or (2) contagious or infectious disease (confirmed by the explanatory certificate of a Veterinary Surgeon); or (3) by its becoming ineligible for the Class in which it has been entered. The fine is not remitted in the case of an exhibitor selling an animal between the time of entry and the date of the Show.

32. Every Exhibitor will be required to undertake to forfeit and pay to the Society the sum of £20, as and for liquidated damages, if any animal which he exhibits be, to his knowledge, suffering from any contagious or infectious disease, and the Stewards are empowered to prevent the entry of any diseased animal into the Yard, or to have it removed therefrom.

33. Any infringement of any of these or any other prescribed Regulations or Conditions will subject the Exhibitor to a fine of £1 by the Stewards, and to the forfeiture, by order of the Council, of any prize to which he may be entitled (in addition to all other consequences attaching to such infringement). The Council reserves to itself the right to inform other Agricultural Associations of any decision it may come to with respect to an Exhibitor.

AWARDS.

34. The Society reserves to itself the right to withhold any prize, if, in the opinion of the Stewards, the conditions and regulations have not been properly complied with, or if, in the opinion of the Judge, there is insufficient merit.

35. Only the signed awards of the Judges are accepted by the Society as evidence that a prize has been awarded, and the production of the prize card or the rosette by an Exhibitor will not entitle him to the prize.

36 The certificate of the Veterinary Inspector, whether as to age or soundness, shall be required only in cases where the Judges are in doubt, or where the

Stewards may consider it necessary. (See also Regulation 46 with reference to Stallions and Mares.) The decision of the Inspector in such cases shall be final and conclusive; and in case it shall be against the animal to which a Prize has been awarded, such animal shall be disqualified from receiving such Prize.

PROTESTS.

37. Any Exhibitor wishing to lodge a protest having reference to Live Stock exhibited at this meeting must make the same in writing on a form to be obtained from the Secretary, and deposit with him the sum of £3. If on investigation the protest is not sustained to the satisfaction of the Stewards, the sum thus deposited shall, at the discretion of the Council, be forfeited to the funds of the Society. All protests (except in the Harness, Saddle or Jumping Classes) must be delivered at the Secretary's Office in the Show Yard, on the day on which the award is made, and no protest will be SUBSEQUENTLY received, unless a reason satisfactory to the Stewards be assigned for the delay. Any protest against an award in the Harness, Saddle or Jumping Classes must be made to the Steward in the ring immediately after the judging of the class to which it refers, and a deposit of £3 must, at the same time, be handed to the Steward. The Stewards will consider such protests at 11 o'clock on the following day at the Secretary's Office, at which time and place any person making a protest must attend or be represented by his authorised agent. The decision of the Stewards shall be final.

APPLYING TO CERTAIN CLASSES ONLY.

HORSES.

38. Horses can be removed from the Yard at night on deposit by the Exhibitor of £3 at the Finance Office, which sum will be forfeited if the House does not return at 8 a.m. each day during the Exhibition. This regulation does not apply to Animals not having a box in the Yard entered in the Harness, Saddle and Jumping Classes only.

39. Exhibitors must provide saddles for Horses in Classes 19 to 26, 31, 34, 36, 38, 39, 41, 42, 48 to 57, and 250 to 255, as they are to be ridden; and vehicles and harness for those in classes 35, 37, 40, and 43 to 47, which are to be driven.

40. No Horse, unless a Foal, will be admitted into the ring without a proper bit.

41. The Prizes for Stallions foaled before 1920 will be withheld until a certificate from the owner is delivered to the Secretary that the Horse has served at least 10 Mares during the current season.

42. All Foals must be the offspring of the Mares with which they are exhibited, and the name of the Sire of the Foal must be stated on the certificate of entry.

43. Mares entered as in Foal shall, except as otherwise stated, hereafter be certified to have produced a living Foal before August 1st of the year of the Show. If the required certificate, which must be on a form obtainable from the Secretary, is not received by September 30, 1922, the prize awarded will be forfeited.

44. Horses may, at the discretion of the Stewards, be measured, and the measurement shall be taken in the shoes worn by the entry at the time of judging, and these shoes shall not be removed to allow of the entry being shown in another class.

45. In the Harness Classes for Hackneys exceeding 14 hands (except yearling colts and fillies) no shoe (nails included) may exceed 2 lbs. in weight, and for Ponies not exceeding 14 hands, yearling colts and yearling fillies, no shoe (nails included) may exceed 1½ lbs. in weight.

46. All Stallions and Mares (yearlings and foals excepted) to which prizes have been awarded in the breeding classes shall be examined by the Society's Veterinary Inspector, and unless pronounced free from indications of hereditary

disease shall be ineligible to receive the prize. The owner of an Animal rejected under this Regulation may, upon his application in writing to the Secretary, be furnished with a copy of the Veterinary Certificate. This Regulation shall not, however, apply to animals holding a Board of Agriculture Certificate for the current year.

47. The following special conditions apply only to the Prizes offered by the Shire Horse Society, viz.: the owner of the animal entered to have been a Member of the Bath and West and Southern Counties Society, for not less than six months previous to April 15, 1922; a Mare five years old, or upwards must produce a Foal in the current year, or have had a Foal in the, preceding year; in the case of in-foal Mares a certificate of foaling must be lodged with the Secretary of the Shire Horse Society before the medal will be despatched. No animal to compete which has won the Shire Horse Society's Gold Medal during the current year; the Royal and London Shows being excepted; the winning animal to be entered, or eligible for entry, in the Shire Horse Society's Stud Book; and a certificate that the winner is free from hereditary disease signed by the Society's Veterinary Inspector after his examination on the Show Ground, must be lodged with the Secretary of the Shire Horse Society, but Stallions licensed by the Board of Agriculture, and Stallions, Mares and Fillies passed at the London Show, shall be exempt from further examination when selected for Medals during the current year. A prize of £5 will also be awarded to the breeder of the animal winning the Medal, provided that he is a member of the Shire Horse Society, and that the Dam is a Mare registered in the Shire Horse Stud Book. All awards must be completed within six months of the date upon which the Medal was awarded, or they will be void. The Council reserves the right to award the prizes only to persons approved by the Shire Horse Society and subject to confirmation in the uncontrolled discretion of the Council.

48. The following special conditions apply only to the Prize offered by the Hunters' Improvement and National Light Horse Breeding Society for Hunter Brood Mares, viz.:—The Mare awarded the Medal must possess a certificate of soundness from hereditary disease, signed by the Bath and West Society's appointed Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the animal on the Show Ground. Any Hunter Brood Mare, 8 years old or over, having been either awarded one of the Society's Gold Medals since 1912, or selected as Reserve for same, or having been passed sound after January 1, 1913, by a Veterinary Surgeon appointed by the Hunters' Improvement and National Light Horse Breeding Society, shall be exempt from further examination upon the owner producing at the time of exhibition the official veterinary certificate issued by the Secretary of that Society.

49. The following special conditions apply only to the Prize offered by the Hunter's Improvement and National Light Horse Breeding Society for best Mare or Gelding of any age exhibited in the Riding Classes. The Hunter awarded the medal must possess a certificate of soundness from hereditary disease, signed by the Bath and West Society's Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the animal on the Show Ground. The selected Mare, if unregistered, or the selected Gelding, if unentered, must be registered or entered within a month of the award in the Hunter Stud Book. No animal may take more than one of these medals in 1922. The Judge, in awarding the Medal, is instructed to give preference to animals showing weight-carrying properties.

NOTE.—No awards of the above-named Society's Prizes or Medals to a Hunter named and registered in the Hunter Stud Book and subsequently entered by the owner under another name, will be recognised or confirmed unless a re-entry has been previously lodged by the owner for the Hunter Stud Book and the new name registered by the Society.

50. The following special conditions apply only to the Silver Medal offered by the Hackney Horse Society in the Single Harness Classes:—All horses

competing for the Medal must be *by a Registered Hackney Sire.* All geldings must be registered in the Stud Book. A certificate signed by the Breeder of any unregistered Mare must be forwarded to the Secretary of the Hackney Horse Society before the Medal is despatched. Each animal must be examined by a qualified veterinary sugeon on the Show Ground, and a certificate of soundness must be supplied. The Medal must be open to all Classes, and not confined to local competition, and the name and number of the sire, and the name and address of the breeder of each animal, should appear in the catalogue. No animal can take more than one Medal in any one year.

51. The following special conditions apply only to the Medals offered by the National Pony Society. Height of Stallions and Colts not to exceed 15 hands, and Mares and Fillies not to exceed 14.2, as confirmed by Hurlingham Certificate or that of a qualified Veterinary Surgeon. Ponies having previously won the National Pony Society's Gold Medal during the current year not to be eligible to compete, and no Pony is qualified to take more than one Silver Medal under the same scheme during any one year. The entry of the Winner must, if not already entered in the Supplement or Stud Book, be duly lodged with the National Pony Society before the Medals will be despatched. All Brood Mares to have foal-at-foot or be due to foal in 1922, or if they have foaled in 1922 and the foal has died, a veterinary certificate to the effect that the foal was born alive to be provided. A medal will not be awarded unless there are at least 3 entries for it when drawn from more than one class, or in the case of a single class, unless there is a minimum of four entries in that class.

52 The following special conditions apply to Horses entered in the Jumping Competitions :—The jumps may consist of single hurdle, gate, double hurdle, bank, wall and water jump, at the discretion of the Judge and Stewards. Each horse competing shall have its catalogue number affixed to its breast in such a way that it may be easily seen by the general public. Each horse competing shall be ridden at the fences in the order announced by the Stewards. In case of a horse refusing his fence it shall be allowed two further trials, and *no more.* No change of rider shall take place during the competition. The Judge may take into consideration the style in which the fences are jumped, as well as the height and breadth, and his decision shall be final.

CATTLE.

53. All cattle must be properly secured to the satisfaction of the Officers of the Society on being brought to the gate of the Yard, or they will not be admitted.

54. All Bulls must have a ring or clamp attached to the nose, and, in the aged Classes, must be provided with a strong chain, and be led with a proper stick.

55. All cattle will be required to be paraded in the ring at least once a day at the discretion of the Stewards.

56. No Bull calved before January 1st, 1920, or in the Aberdeen-Angus Classes before December 1st, 1919, will be eligible to receive a Prize until certified to have served not less than six different Cows (or Heifers) previous to June 1st, 1922, and to be the sire of live calves dropped in the year 1922, or in the Aberdeen-Angus Classes after December 1st, 1921.

57. No Cow or Heifer, entered as in-milk, will be eligible to receive a Prize unless certified to have had a living Calf within the fifteen months preceding the date of the Show, or that the Calf, if dead, was born at the proper time.

58. Every Cow or Heifer in-milk shall be milked dry in the Show Yard at 7.30 p.m. on the evening preceding the day of judging, in the presence of an officer of the Society appointed for the purpose.

59. Any animal in the Cattle Classes found to be artificially coloured will be disqualified.

60. The milk yielded by Cows in the Show Yard must not be sold at the stalls, but will be purchased by the Society for the purposes of the Dairy at a price to be agreed upon, and will be paid for on delivery at the Milk Receiving Office in the Dairy.

61. The following conditions apply only to the prizes offered for Pedigree Dairy Shorthorn and Devon and South Devon Milking Cows :—The Cows and Heifers entered will be clean milked out at 6 o'clock on the evening preceding the opening of the Show to the satisfaction of the Stewards, and will be again milked in the ring on the first morning of the Show in the presence of the Judge, who shall see the Milk weighed, and any animal not yielding up to the following standard will not be awarded a prize :—

	Having Calved within 2 calendar months of the 1st day of the Show.		Having calved between 2 and 3 calendar months of the 1st day of the Show.		Having calved more than 3 calendar months of the 1st day of the Show.	
	lbs. of milk.		lbs. of milk.		lbs. of milk.	
	Shrthns.	Dvns. & S.Dvns	Shrthns.	Dvns & S Dvns	Shrthns.	Dvns & S Dvns.
Cows, 5 years and upwards ..	30	22	27	21	24	18
Cows, 4 years and under 5 years..	26	20	23	20	20	17
Cows or Heifers, 3 years and under 4 years	22	18	19	17	16	14
Heifers, under 3 years old	18	15	15	13	12	10

62. The following conditions shall apply only to the prizes offered for Pedigree Dairy Shorthorn Bulls and Heifers:—No Bull is eligible to compete unless it has been registered or accepted for registration in the Year Book of the Dairy Shorthorn Association. The dam and sire's dam of the Animals entered to have received, in or before 1918, a Certificate of Merit in Milking trials or tests recognised by the Dairy Shorthorn Association, or in an inspection class confined to Pedigree Dairy Shorthorns where the standard weight of milk has been a necessary qualification, or to hold a yearly record, published in the Association's Year Book, up to mid-day, October 1st, 1919, or after that date a record within 315 days after calving (published or accepted as eligible for publication as follows) :—(1) Cows, 4 years old and upwards at date of calving, 8,000lbs. ; (2) Cows, over 3 years old and under 4 years old at date of calving, 6,000lbs. ; (3) Heifers, 3 years old and under at date of calving, 5,000lbs. No Bull having taken one of the Association's Prizes is eligible to compete again the same year, except at the R.A.S.E. Show. The prizes in this class will not be awarded unless there are at least three individual exhibitors. A certificate from the Dairy Shorthorn Association stating that the Bull is entered in their Register must be furnished by the exhibitor at the time of making the entry.

63. In the Dexter Classes clipping (except in the case of a few hairs on the top of the tail) will disqualify an animal.

64. The following conditions apply to animals entered in the Milk and Butter Test Classes :—The date of last calving must be given on the entry form and, when an animal calves between the date of entry and that of the Show, notice of such calving must be sent to the Secretary or the animal may be disqualified. Points for Lactation will be allowed as follows :—One point for every completed 10 days since calving, calculated to the first day of the show, deducting the first 40 days. Maximum lactation points 12, but subject to the following conditions :—(a) Cows served within 90 days after calving, but not later, may obtain maximum points for lactation. (b) Cows which have calved 91 to 120 days and whose last service has been within that time, but not later, can only obtain a maximum

of 8 points for lactation; (*c*) Cows not served within 120 days after calving can only obtain a maximum of 5 points for lactation; (*d*) Cows which have calved 121 to 150 days and whose last service has been within that time, but not later can only obtain a maximum of 4 points for lactation; (*e*) Cows not served within 150 days after calving can only obtain a maximum of 2 points for lactation; (*f*) Cows which have calved 151 days or more, whether served or not after that time, will not receive any points for lactation. A certificate giving the last date of calving and the last date of service, and stating that the Cow has not broken her service since that date, signed by the Owner of the Cow exhibited or his Agent, to be delivered by the Herdsman to the Steward or Judge of the Test on or before the first day of the Show.

65. Except in Local and Dairy Classes, every animal entered for competition must be entered, or certified as eligible to be entered, in the Herd Book of its Breed, where such Herd Book exists and has been in existence for not less than seven years, and all cattle must be tattooed in accordance with the rules of their respective Breed Societies, where such rules exist. Where an animal is entered by the Exhibitor as eligible for entry in the Herd Book of its breed, proof of such eligibility must be furnished to the Secretary at the time of making the entry.

SHEEP.

66. Each pen of Ewes must be of the same Flock.

67. The following conditions apply to the special prize offered by the Southdown Sheep Society:—The sheep competing must be entered or eligible for entry in the Flock Book. In the Class for pairs of ram lambs, exhibitors will have the privilege of competing for the medal with any one of their exhibits.

68. Except in Local Classes every animal entered for competition must be entered or certified as eligible to be entered, in the Flock Book of its Breed, where such Flock Book exists and has been in existence for not less than seven years, and all Sheep must be tattooed in accordance with the rules of their respective Breed Societies where such rules exist. Where an animal is entered by the Exhibitor as eligible for entry in the Flock Book of its breed, proof of such eligibility must be furnished to the Secretary at the time of making the entry.

PIGS.

69. The pair of Pigs in each pen must be of the same litter.

70. All Sows farrowed before 1922 shall be certified to have had a litter of live Pigs within six months preceding the first day of exhibition, or to be in-Pig at the time of entering, so as to produce a litter of Pigs, farrowed at their proper time, before the 1st of September following. In the case of in-Pig Sows the Prize will be withheld until the Exhibitor shall have furnished the Secretary with a certificate of farrowing as above. If the required Certificate, which must be on a form obtainable from the Secretary, is not received on or before the 15th September following, the prize awarded will be forfeited.

71. All Pigs exhibited with a Sow shall be her own produce, of the same litter, and not exceeding two months old at the time of the Show.

72. No Sow above 18 months old that has not produced a litter of live Pigs shall be eligible to compete in any of the Classes.

73. Any animal in the Pig Classes found to be artificially coloured will be disqualified.

74. Should any question arise as to the age of any exhibit in the Pig Classes, the Stewards shall at the request of the Judge, have the state of their Dentition examined by a competent authority. If the state of the Dentition shall indicate that the age of any of the Pigs does not agree with the Dentition Test, the Stewards

shall report the same to the Council, who shall have power to disqualify such Pig or Pigs. The following is the state of Dentition in Pigs which will be considered as indicating that they exceed the ages specified below:—Six Months: Pigs having their corner permanent incisors cut will be considered as exceeding this age. Nine Months: Pigs having their permanent tusks more than half up, will be considered as exceeding this age. Twelve Months: Pigs having their central permanent incisors up, and any of the three first permanent molars cut, will be considered as exceeding this age. Fifteen Months: Pigs having their lateral temporary incisors shed, and the permanents appearing, will be considered as exceeding this age. Eighteen Months: Pigs having their lateral permanent incisors fully up will be considered as exceeding this age.

75. Except in the Local Classes, every animal entered for competition must be entered or certified as eligible to be entered in the Herd Book of its breed, where such Herd Book exists and has been in existence for not less than seven years and must conform to the rules of their respective Societies.

HERDS, GOATS, CIDER, POULTRY, DAIRY PRODUCE, BUTTER-MAKING, MILKING AND SHOEING COMPETITIONS.

For Conditions and Regulations see entry form.

ADJUDICATION OF PRIZES.

76. The Judges are instructed as follows, and entries are received subject to this:—

a. Not to award any Prize or Commendation unless the entry possesses sufficient merit.

b. Not to award a Prize to any Horse or Mare, unless it is free from unsoundness likely to be transmitted to its progeny; or if a Gelding, unless free from unsoundness; in either case, an accident having temporary consequences only excepted, and in awarding the Hunters' Improvement Society's Medals to give preference to animals showing weight-carrying properties.

c. In awarding Prizes to Cattle, Sheep, and Pigs, to decide according to the relative merits of the animals for Breeding purposes, and not to take into consideration their present value to the butcher.

d. To make the milking capacity and form of udder one of the chief points in awarding prizes to Cows and Heifers in milk.

e. To draw the attention of the Stewards to any exhibit that has been improperly prepared for exhibition or is wrongly entered.

f. To give in a "Reserve Number" in each Class, indicating the animal or exhibit which in their opinion possesses sufficient merit for the Prize, if the animal or exhibit to which the Prize is awarded should become disqualified. Should the "Reserved Number" succeed to a prize, and be itself disqualified, the prize will be forfeited.

g. Immediately after the Judging to deliver to the Stewards their signed awards stating the numbers to which the Prizes are adjudged, and noting all disqualifications.

77. Should any question arise upon which the Judges may desire a further opinion, the Stewards shall provide them with a Referee.

Payment of Prizes.

78. Cheques for the Prizes awarded (except where further qualification of an animal is required) will be drawn at the meeting of the Finance Committee held in July, 1922, and will then be forwarded by post to the Exhibitors to whom they have been awarded.

INTERPRETATION OF CONDITIONS.

79 The Society reserves to itself by its Council the sole and absolute right to interpret these or any other prescribed conditions and regulations, or Prize Sheets, and to arbitrarily settle and determine all matters, questions or differences in regard thereto, or otherwise arising out of or connected with or incident to the Show. Also to refuse and to cancel any entries, disqualify Exhibitors, prohibit exhibition of entries, vary or cancel awards of prizes or reserved numbers, and relax conditions, as the Society may deem expedient.

POULTRY.

Entry Fees: Class 1, Members, 4/-; Non-Members, 6/-; Other Classes, Members, 3/-; Non-Members, 4/- each entry.

Judges—C. B. BREEZE, Buckfastleigh, Devon (Classes 1 to 23, 50 to 53 and 58 to 71); and H. C. ANTHONY, Home Farm, Euston, near Chorley (Classes 1, 24 to 49 and 54 to 71).

(Under Poultry Club Rules).

The Birds in Classes 1 to 49 must have been hatched previous to January 1st, 1922.

CLASS.	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.
1.—Any Pure Breed, best mated to produce Table Poultry.—Cock and 3 Hens, bred in 1920 or 1921, the property of one Exhibitor	3	0	2	0	1	0
2.—COCHIN or BRAHMA—Cock	1	0	0	15	0	10
3.—Ditto—Hen	1	0	0	15	0	10
4.—PLYMOUTH ROCK—Cock	1	0	0	15	0	10
5.—Ditto—HEN	1	0	0	15	0	10
6.—ORPINGTON (Buff)—Cock	1	0	0	15	0	10
7.—Ditto—Hen	1	0	0	15	0	10
8.—ORPINGTON (Black)—Cock	1	0	0	15	0	10
9.—Ditto—Hen	1	0	0	15	0	10
10.—ORPINGTON (White)—Cock	1	0	0	15	0	10
11.—Ditto—Hen	1	0	0	15	0	10
12.—MINORCA—Cock	1	0	0	15	0	10
13.—Ditto—Hen	1	0	0	15	0	10
14.—RHODE ISLAND RED—Cock	1	0	0	15	0	10
15.—Ditto—Hen	1	0	0	15	0	10
16.—SUSSEX (Speckled)—Cock	1	0	0	15	0	10
17.—Ditto—Hen	1	0	0	15	0	10
18.—SUSSEX (Any other variety) Cock	1	0	0	15	0	10
19.—Ditto—Hen	1	0	0	15	0	10
20.—DORKING (Any variety)—Cock	1	0	0	15	0	10
21.—Ditto—Hen	1	0	0	15	0	10
22.—FAVEROLLES—Cock or Hen	1	0	0	15	0	10
23.—LANGSHAN—Cock or Hen	1	0	0	15	0	10
24.—WYANDOTTE (Silver or Gold Laced)—Cock	1	0	0	15	0	10
25.—Ditto—Hen	1	0	0	15	0	10
26.—Ditto (White)—Cock	1	0	0	15	0	10
27.—Ditto—Hen	1	0	0	15	0	10
28.—Ditto (Black)—Cock	1	0	0	15	0	10
29.—Ditto—Hen	1	0	0	15	0	10
30.—Ditto (Any other colour)—Cock	1	0	0	15	0	10
31.—Ditto—Hen	1	0	0	15	0	10
32.—LEGHORN (White)—Cock	1	0	0	15	0	10
33.—Ditto—Hen	1	0	0	15	0	10
34.—Ditto (Any other colour)—Cock	1	0	0	15	0	10
35.—Ditto—Hen	1	0	0	15	0	10
36.—HAMBURG (Black)—Cock	1	0	0	15	0	10
37.—Ditto—Hen	1	0	0	15	0	10
38.—Ditto—(Any other colour)—Cock	1	0	0	15	0	10

POULTRY—*continued.*	First Prize. £		Second Prize £		Third Prize. £	
Class.						
39.—Ditto—Hen		0	0	15	0	10
40.—Old English Game (Black Red)—Cock		0	0	15	0	10
41.—Ditto—Hen		0	0	15	0	10
42.—Ditto (Any other colour)—Cock		0	0	15	0	10
43.—Ditto—Hen		0	0	15	0	10
44.—Indian Game—Cock		0	0	15	0	10
45.—Ditto—Hen		0	0	15	0	10
46.—French (excluding Faverolles)—Cock		0	0	15	0	10
47.—Ditto—Hen	1	0	0	15	0	10
48.—Any Other Distinct Breed not previously mentioned (excluding Bantams)—Cock	1	0	0	15	0	10
49.—Ditto—Hen	1	0	0	15	0	10

SELLING CLASSES.

50.—Any Distinct Breed—Cock or Cockerel (Price not to exceed £1 1s.)	1	0	0	15	0	10
51.—Any Distinct Breed—Hen or Pullet (Price not to exceed £1 1s.)	1	0	0	15	0	10

CHICKENS OF 1922.

52.—Cochin, Brahma, Plymouth Rock, Orpington, Langshan, Sussex or Dorking—Cockerel	1	0	0	15	0	10
53.—Ditto—Pullet	1	0	0	15	0	10
54.—Minorca, Wyandotte, Leghorn, Hamburg, Faverolles or French—Cockerel	1	0	0	15	0	10
55.—Ditto—Pullet	1	0	0	15	0	10
56.—Game, Malay, or any other Distinct Breed not previously mentioned—Cockerel	1	0	0	15	0	10
57.—Ditto—Pullet	1	0	0	15	0	10

LIVE TABLE POULTRY.

58.—Pair of Cockerels of any Pure Breed, hatched in 1922	1	0	0	15	0	10
59.—Pair of Pullets of any Pure Breed, hatched in 1922	1	0	0	15	0	10
60.—Pair of Cross-bred Cockerels, hatched in 1922	1	0	0	15	0	10
61.—Pair of Cross-bred Pullets, hatched in 1922	1	0	0	15	0	10

SPECIAL PRIZES.

Offered by the Poultry Club.

BATH AND WEST AND SOUTHERN COUNTIES CUP (Value £10 10s.) For the Best Bird in the Show, the property of a Member of the Poultry Club. The Cup to be won three times, not necessarily in succession, by the same exhibitor before becoming his absolute property.

A Silver Medal for best Cock or Cockerel in the Poultry Classes, the property of a Member of The Poultry Club.

" " " Hen or Pullet, ditto, ditto.

The Associated Society's Bronze Medal for the Best Bird in the Show (Winner need not be a Member of The Poultry Club, but must be a Member of the Bath and West and Southern Counties Society).

POULTRY—*continued.*

DUCKS, GEESE AND TURKEYS.

Class.	First Prize £	s.	Second Prize £	s.	Third Prize. £	s.
62.—Drake or Duck (Aylesbury)	1	0	0	15	0	10
63.— „ „ (Rouen)	1	0	0	15	0	10
64.— „ „ (Pekin)	1	0	0	15	0	10
65.—Gander or Goose	1	0	0	15	0	10
66.—Turkey—Cock or Hen	1	0	0	15	0	10

DEAD TABLE POULTRY.

(To be forwarded Killed and Plucked).

67.—Pair of Cockerels of 1922, of any Pure Breed ..	1	0	0	15	0	10
68.— „ Pullets, ditto. ditto	1	0	0	15	0	10
69.—Pair of Cross-bred Cockerels of 1922	1	0	0	15	0	10
70.— „ „ Pullets ditto	1	0	0	15	0	10
71.—Pair of Ducklings of 1922	1	0	0	15	0	10

POULTRY.

(*Under Poultry Club Rules.*)

CONDITIONS AND REGULATIONS.

CHARGES, &c.

1. Exhibitors may make an unlimited number of Entries on payment of fees as follows :—

	MEMBERS. s. d.	NON MEMBERS. s. d.
For each entry (Class 1)	4 0	6 0
,, (other Classes)	3 0	4 0

The above fees include coops, food, and attendance.

N.B.—The above fees *must* be sent with the entries, or no notice will be taken of the latter.

2. The privilege of entering at Member's fees is strictly limited to Members of the Bath and West Society, or of the Devon County Agricultural Association elected on or before January 31, 1922, and subscribing not less than £1 annually.

3. All entries must be made on the printed forms to be obtained of the Secretary (F. H. STORR, 3, Pierrepont Street, Bath), and such forms must be correctly filled up and returned to the Secretary, together with all fees due, on or before May 6. Exhibitors are requested to carefully examine the List of Prices and Conditions, as the Society cannot be responsible for any errors made by Exhibitors in the entry forms, and birds entered in a wrong Class will be necessarily excluded from competition. No alterations can be made in entry forms after they have been received by the Secretary.

4. The Council reserve the right to refuse the entries of any person.

5. Exhibitors must state the price and breed of their birds on their entry forms.

SHOW YARD.

6. All birds must be in the Show Yard by 6 p.m. on *Wednesday, May* 31, and no bird can be removed before 7 p.m. on *Tuesday, June* 6. Any Exhibitors who send for their birds must do so between 7 and 8 p.m. on that day.

7. All carriage must be prepaid to Plymouth Railway Station, otherwise the birds will not be received at the Exhibition ; but they will be conveyed free of expense from the Station to the Show Yard and back.

8. No Exhibitor or Servant will be allowed into the tent until the birds have been judged.

9. The Poultry Tent will not be open to the public until 2 o'clock on the first day of the Exhibition.

10. A Non-Transferable Admission Ticket for the Exhibition will be sent to each Exhibitor whose entry fees amount to £1 and upwards.

TABLE POULTRY.

11. In these Classes (58 to 61 and 67 to 71), quality for the table will be considered before mere weight. The date of hatching must be given and, in the case of cross bred birds, the breeds of the parents.

12. In Classes 67 to 71 the Birds must be sent killed and plucked. They will be withdrawn from exhibition when considered necessary, and, if unsold, will be

returned to Exhibitors after 6 p.m. on Saturday, June 3. Exhibitors are recommended to put a reasonable price upon their exhibits in these Classes so as to promote the sale of them.

SALES.

13. All birds may be claimed, at the price put upon them, any time after 4 o'clock on Thursday, June 1, and a sale *must take place* if the price stated be paid to the Clerk in the Poultry Office at the time of claiming. *No alteration can be made in the prices stated on the entry forms* and in the Catalogue until after Saturday, June 3, when the price may be reduced on payment to the Steward of one shilling per pen on each alteration. Birds must be *sold in pens*, and the price stated must include the basket. Birds entered in selling classes must be sent in separate hampers. A charge of 10 per cent. will be made for all birds sold. The persons who have the management of the sales cannot take charge of birds which are disposed of privately.

AWARDS.

14. No second prize will be given in any of the Classes unless there are three entries, and no third prize unless there are six entries.

DISQUALIFICATION.

15. The Judges are empowered to withhold a prize or prizes where the birds are not considered of sufficient merit, or in the chicken classes where they consider them over age, and are instructed to disqualify any that have been clipped, drawn, trimmed, marked, or dyed. In the Game Classes birds can be shown either dubbed or undubbed.

16. An Exhibitor detected in a false statement as to the age, etc., of any bird, or in any other practice calculated to deceive or mislead the Judges or Stewards, shall forfeit all or any prizes awarded to him or her at the Show, and will be disqualified from competing at any future Show of the Society, and the Council shall have power to inform other Societies of their action in this respect.

17. No person who shall have been shown to the satisfaction of the Council to have been excluded from exhibiting for Prizes at the exhibition of any other Society in consequence of having attempted to obtain a Prize by giving a false Certificate, or by other unfair means, and no person who is under exclusion from any Breed Society for fraudulent practices, shall be allowed to exhibit at this or any other Meeting of the Society.

18. Unhealthy birds will not be exhibited, but will be immediately returned to their owners, and the fees will be forfeited.

PROTESTS.

19. In order to check frivolous and vexatious protest, no protest will be entertained unless accompanied by a deposit of £1 in each case; and in case the protest is not substantiated the deposit may be forfeited to the Funds of the Society. All protests must be made before 12 o'clock (noon) on Friday, June 2.

FORFEITS.

20. Persons entering birds and failing to send the same to the Exhibition will forfeit the entrance fee for each pen so left vacant.

GENERAL.

21. All birds shown must be *bona fide* the property of the Exhibitor.

22. For each pen entered the Exhibitor will receive a label, on the reverse side of which he must legibly write his name and address for the return journey.

23. All eggs laid at the Exhibition will be destroyed.

24. The Stewards pledge themselves to take every care of the birds exhibited, but neither they nor the Society will, in any case, be responsible for any accident loss or damage, from whatever cause arising, the exhibits being entered at the sole risk of the Exhibitors, and Exhibitors will be required to hold the Society harmless in the event of loss.

25. In case of death of any bird during the Exhibition, it will be sent back for the inspection of the Exhibitor.

26. The Poultry Department is subject to the Rules and Regulations of the Society and its officers.

⁂ *The use of properly-constructed Poultry Baskets will facilitate the safe and speedy conveyance of the birds to and from the Exhibition and all Birds entered in Selling Classes must be sent in separate hampers.*

The Society cannot, under any circumstances, undertake to send telegrams to Exhibitors as to Judges awards.

Applications for Catalogues and printed lists of awards should be made only to the Publishers, Messrs. W. Lewis & Sons, *Herald Office, Bath.*

By order of the Council.

3, *Pierrepont Street, Bath.* **F. H. STORR,** *Secretary.*

Telegraphic Address:—"**AGRICULTURE, BATH.**"
Telephone No **610.**

FINANCIAL STATEMENTS

FOR

1921

WITH ITEMS OF 1920 *FOR COMPARISON.*

	PAGES
SUMMARY OF CASH ACCOUNT	clxxviii—clxxix
ANNUAL CASH ACCOUNT	clxxx—clxxxix
ASSETS AND LIABILITIES ACCOUNT	cxc
FINANCIAL RESULT OF SHOW	cxci

The Bath and West and

SUMMARY OF THE CASH ACCOUNT

WITH COMPARATIVE

DR.

Page of accompanying Cash Account.	RECEIPTS.				1921. Bristol.						1920. Salisbury.		
					£	s.	d.	£	s.	d.	£	s.	d.
	General:–												
clxxx	Dividends and Interest				767	16	5				738	9	2
,,	General Receipts				0	1	0				1	16	0
,,	Subscriptions from Members				1,171	13	0				910	17	0
,,	Life Members				190	0	0				160	0	0
,,	Journal				80	8	11				82	8	10
								2,209	19	4	1,893	11	0
	Show:–												
clxxxii	Implements				4,121	15	10				3,118	16	8
		£	s.	d.									
,,	Horses	2,496	3	0							1,247	9	6
,,	Cattle, Sheep, Goats and Pigs	3,460	13	6							2,410	2	0
,,	Catalogues, Fodder Sales, &c.	192	4	0							143	5	3
					6,149	0	6				3,800	16	9
clxxxiv	Poultry				95	2	3				77	7	3
,,	Shoeing				31	0	0				37	0	0
,,	Nature Study and Handicrafts				2	2	0				23	6	0
,,	Small Holdings and Allotments				236	2	6						
clxxxvi	Cheese and Butter				100	5	9				83	15	0
,,	Working Dairy				260	17	1				244	2	8
,,	Cider				8	15	0				12	5	0
,,	Bottled Fruit										8	10	0
,,	Admissions				14,049	14	3				6,237	10	0
clxxxviii	Unapportionable:—												
	Contract Premiums and Cloak Rooms	800	4	10							465	18	11
	Sales and Fittings	861	18	10							416	11	10
					1,662	3	8				882	10	9
clxxxviii	Subscription from Plymouth for 1922 Show				800	0	0				800	0	0
								27,516	18	10	15,326	0	1
								29,726	18	2	17,219	11	1
	Deposit returned							5,000	0	0			
	Balance in Bank, January 1st										56	17	9
	Balance due to Bank, December 31st							3610	2	6	1,739	14	1
								£ 38,337	0	8	19,016	2	11

Southern Counties Society.

FOR THE YEAR ENDING DEC. 31st, 1921.

STATEMENT FOR 1920. Cr.

Page of accompanying Cash Account.	PAYMENTS.	£ s. d.	1921 Bristol. £ s d	1921 Bristol. £ s. d.	1920 Salisbury. £ s. d.
	General:—				
clxxxi	Salaries		1,210 8 0		1,156 0 9
„	Printing, Postage, Stationery, &c.		671 12 5		722 15 7
„	Journal		593 19 3		603 5 11
				2,475 19 8	2,482 2 3
	Show:—				
clxxxiii	Implements		2,271 4 1		1,738 1 0
„	Horses	3,000 0 4			1,729 13 0
„	Cattle, Sheep, Goats and Pigs	4,940 8 4			3,448 10 6
„	Fodder, &c.	1,689 9 3			1,234 0 8
			9,629 17 11		6,412 4 2
clxxxv	Poultry		361 10 11		373 11 5
„	Shoeing		218 5 6		244 16 1
„	Nature Study and Handicrafts		242 18 6		249 18 7
„	Forestry		269 10 11		256 9 3
	Small Holdings and Allotments		387 12 3		
„	Horticulture		325 0 6		319 3 6
clxxxvii	Cheese and Butter		309 16 0		250 13 9
„	Working Dairy		924 9 7		936 15 9
„	Cider		159 7 1		154 3 1
„	Bees		5 0 0		
„	Bottled Fruit				18 0 10
„	Public Announcements		956 8 8		705 11 10
clxxxix	Unapportionable:—				
	Erection of Offices, &c.	4,540 18 8			3,203 0 6
	Carriage of Plant	163 13 3			159 2 8
	Stand Fittings	499 5 10			234 10 0
	Police				540 16 1
	Miscellaneous	920 16 7			603 2 2
			6,124 14 4		4,740 11 5
	Plymouth Show—				
	Timber and Stacking	5,769 0 10			
	Carriage of ditto	983 5 2			
			6,752 6 0		
				28,933 2 3	16,400 0 8
clxxxix	**Experiments:—**			147 4 8	100 0 0
				31,561 6 7	18,982 2 11
	Investments and Deposit			5,036 0 0	34 0 0
	Balance due to Bank, Jan. 1st			1,739 14 1	
				£38,337 0 8	19,016 2 11

January 18*th*, 1922.
Audited and found correct,
F. CLIFFORD GOODMAN, F.C.A.,
Auditor.

Passed by Council,
January 31*st*, 1922,
F. H. STORR,
Secretary.

The Bath and West and

Dr. CASH ACCOUNT FOR THE YEAR ENDING DEC. 31st,

RECEIPTS.		1921. Bristol. £ s. d.	£ s. d.	1920. Salisbury. £ s. d.
DIVIDENDS AND INTEREST :—				
War Loan Stock	£201 14 11			205 9 6
Ditto (to replace Capital lost by Conversion)	11 13 9			6 19 0
South Australian Stock	29 0 4			29 0 4
New Zealand Stock	38 8 4			38 8 4
India Stock	158 6 4			158 6 4
Queensland Stock	46 3 8			46 3 8
New South Wales Stock	49 1 4			49 1 4
Canadian Pacific Railway Stock	47 5 0			47 5 0
Interest on Deposit	28 7 1			
		610 0 9		580 13 6
Income Tax returned		157 15 8		157 15 8
			767 16 5	738 9 2
GENERAL RECEIPTS :—				
Telephone Way-leave		0 1 0		0 1 0
Cancelled Cheques, etc.				1 15 0
			0 1 0	1 16 0
SUBSCRIPTIONS FROM MEMBERS :-				
Arrears		25 2 0		29 16 0
Governors		164 7 0		149 18 0
Subscribers of £1 and upwards		974 14 0		724 3 0
,, 10s. ,,		7 10 0		7 0 0
			1,171 18 0	910 17 0
LIFE COMPOSITIONS :—			190 0 0	160 0 0
JOURNAL :—				
Sales		10 18 6		4 15 1
Advertisements		69 10 5		77 13 9
			80 8 11	82 8 10
Carried forward		£	2,209 19 4	

Southern Counties Society.

1921, WITH COMPARATIVE STATEMENT FOR 1920 Cr.

PAYMENTS.	1921. Bristol.						1920. Salisbury.		
	£	s.	d.	£	s.	d.	£	s.	d.
SALARIES :—									
Secretary	550	0	0				550	0	0
Assistant Secretary	450	0	0				400	0	0
Office Staff	150	8	0				151	0	9
Auditor	30	0	0				25	0	0
Consulting Chemist	30	0	0				30	0	0
				1,210	8	0	1,156	0	9
MISCELLANEOUS :—									
Printing	54	12	9				53	17	9
Stationery and Finance Books	75	17	3				57	17	11
Postages, Telegrams, Cheque & Receipt Stamps	120	15	11				91	15	8
Ground Rent and Rates	37	18	2				30	19	4
Property Tax	11	5	0				11	5	0
Travelling Expenses	55	12	5				43	3	3
Carriage of Goods	6	3	4				3	17	4
Directories and Reference Books . .	0	15	6				0	8	0
Subscriptions	7	0	0				8	17	0
Repairs and Fittings	41	13	10				98	18	3
Hire of Council Rooms	1	1	3				1	1	0
Fuel and Light	9	4	5				8	1	7
Finance and other Committee's Expenses .	4	14	0				9	11	6
Telephone	8	7	8				7	16	0
Bank Charges	84	8	11				20	6	0
Council Grants and Allowance to Widow of late Secretary	150	0	0				275	0	0
Miscellaneous	2	2	0						
				671	12	5	722	15	7
JOURNAL :—									
Editor	100	0	0				100	0	0
Associate Editor . .							25	0	0
Printing and Binding .	382	5	9				377	1	6
Plans and Blocks . .	20	0	0				20	4	0
Journal Distribution	44	4	6				27	0	8
Postages, Stationery, Reference Books, etc. .	8	15	0				7	0	9
Payments to Authors	38	14	0				46	19	0
				593	19	3	603	5	11
Carried forward .			£	2,475	19	8			

DR. CASH ACCOUNT—*continued.*

RECEIPTS.		1921 Bristol. £ s. d.	1921 Bristol. £ s. d.	1920. Salisbury. £ s. d.
Brought forward			2,209 19 4	
IMPLEMENTS :—				
Fees for Space :—				
Machinery-in-Motion Shedding		1,390 0 0		1,184 15 0
Ordinary ,,		433 1 0		474 0 0
Miscellaneous ,,		395 0 0		303 15 0
Boarded ,,		1,062 5 0		708 15 0
Seed ,,		38 0 0		78 5 0
Uncovered Ground		574 5 7		213 9 2
Catalogue Fees		105 1 9		84 17 6
Entry Fees		97 0 0		71 0 0
Additional Assistants' Tickets		27 2 6		
			4,121 15 10	3,118 16 8
HORSES, CATTLE, SHEEP, GOATS & PIGS :—				
Horses :—Entry Fees	£545 1 0			357 17 6
Fines	2 0 0			2 10 0
Grand Stand Admissions	1,406 2 0			794 2 0
Special Prizes	543 0 0			93 0 0
		2,496 3 0		1,247 9 6
CATTLE, SHEEP, GOATS AND PIGS —				
Entry Fees	£1,931 10 0			1,644 12 0
Fines	43 6 0			31 0 0
Special Prizes	1,485 17 6			734 10 0
		3,460 13 6		2,410 2 0
Catalogues, Manure and Fodder	£179 12 0			130 13 3
Advertisement in Prize List	12 12 0			12 12 0
		192 4 0		143 5 3
			6,149 0 6	3,800 16 9
Carried forward			£ 12,480 15 8	

CASH ACCOUNT—*continued*. Cr.

PAYMENTS.		1921. BRISTOL.		1920. SALISBURY.
		£ s. d.	£ s. d.	£ s d.
Brought forward			2,475 19 8	
IMPLEMENTS :—				
Shedding		2,024 8 3		1,568 19 1
Stewards and Assistants		93 12 4		68 5 6
Printing, Stationery, etc.		97 9 6		63 19 9
Fees returned . .		55 14 0		31 16 8
			2,271 4 1	1,738 1 0
HORSES, CATTLE, SHEEP, GOATS & PIGS :—				
Horses :—Prizes .	£1,174 8 0			717 16 8
Shedding & Grand Stand	1,689 18 4			873 16 8
Stewards and Assistants	85 8 7			84 0 0
Judges . . .	50 5 5			48 19 8
		3,000 0 4		1,729 13 0
Cattle Prizes .	1,324 0 0			1,181 10 0
Sheep Prizes .	618 0 0			588 0 0
Goats Prizes .	28 0 0			
Pigs Prizes .	453 8 0			249 5 0
Dairy Farm Prizes . .	190 0 0			57 15 0
Shedding and Canvas	2,073 5 8			1,175 16 6
Stewards and Assistants	66 4 0			43 5 2
Judges . . .	182 14 8			142 13 10
Fees returned, etc. .	4 16 0			10 5 0
		4,940 8 4		3,448 10 6
Buildings, etc. . . .	820 15 2			669 18 1
Fodder and Insurance .	570 14 6			345 18 4
Fodder Assistants .	20 10 6			30 0 9
Veterinary Inspector .	25 1 5			29 6 6
Rosettes . . .	25 5 0			18 16 8
Printing and Stationery .	206 17 7			124 14 10
Refreshments for Judges .	20 5 1			15 5 6
		1,689 9 3		1,234 0 8
			9,629 17 11	6,412 4 2
Carried forward .		£	14,377 1 8	

Dr.

CASH ACCOUNT—*continued.*

RECEIPTS.	1921. Bristol.						1920. Salisbury.		
	£	s.	d.	£	s.	d.	£	s.	d.
Brought forward				12,480	15	8			
POULTRY :—									
Entry Fees	91	11	0				71	16	0
Commission on Sales	3	11	3				1	11	3
Special Prizes							4	0	0
				95	2	3	77	7	3
SHOEING :—									
Entry Fees	18	0	0				19	0	0
Special Prizes	13	0	0				18	0	0
				31	0	0	37	0	0
NATURE STUDY AND HANDICRAFTS :—									
Fees for Space				2	2	0	23	6	0
SMALL HOLDINGS AND ALLOTMENTS :—									
Entry Fees	13	7	6						
Special Prizes	222	15	0						
				236	2	6			
Carried forward				12 845	2	5			

CASH ACCOUNT—*continued.* Cr.

PAYMENTS.	1921. Bristol.		1920. Salisbury.
	£ s. d	£ s. d.	£ s. d.
Brought forward		14,377 1 8	
POULTRY :—			
Sheds, Staging, Pens and Runs	171 19 8		168 19 7
Steward and Assistants	31 7 9		36 0 10
Judges	8 17 6		10 18 0
Prizes	129 10 0		124 5 0
Printing, Stationery, Carriage, Food, etc.	19 16 0		33 8 0
		361 10 11	372 11 5
SHOEING :—			
Prizes	31 0 0		36 10 0
Judges	9 2 6		8 13 6
Anvils, Forges, Coals, Horses, Printing, etc	5 19 6		44 15 9
Shedding	133 14 2		100 14 5
Stewards and Assistants	14 19 4		15 12 5
Fees returned	8 10 0		9 10 0
Exhibition of Models	15 0 0		20 0 0
		218 5 6	244 16 1
NATURE STUDY AND HANDICRAFTS :—			
Labour and Fittings	186 15 0		222 3 11
Steward and Assistants	25 5 0		17 10 11
Printing, Postage, Carriage, etc.	30 18 6		10 3 9
		242 18 6	249 18 7
FORESTRY :—			
Labour and Fittings	178 11 8		220 5 6
Steward, Judge and Assistants	16 10 9		10 0 3
Printing, Postage, etc.	14 16 0		8 17 6
Prizes	9 12 6		12 6 0
Demonstrations	50 0 0		5 0 0
		269 10 11	256 9 3
SMALL HOLDINGS AND ALLOTMENTS :—			
Labour and Fittings	81 11 8		
Steward, Judges and Assistants	69 13 7		
Printing, Postages, etc.	11 7 0		
Prizes	225 0 0		
		387 12 3	
HORTICULTURE :—			
Gratuities to Gardeners	150 0 0		150 0 0
Pavilion and Staging	149 2 9		146 2 0
Steward and Assistants, Printing, etc.	25 17 6		23 1 6
		325 0 6	319 8 6
Carried forward	£	16,182 0 3	

Dr.

CASH ACCOUNT—*continued.*

RECEIPTS.		1921. Bristol.		1920. Salisbury.
		£ s. d.	£ s. d.	£ s. d.
Brought forward . .			12,845 2 5	
CHEESE AND BUTTER :—				
Entry Fees		71 4 0		47 7 0
Sales		18 16 0		22 3 0
Special Prizes and Fines		10 5 0		14 5 0
			100 5 0	83 15 0
WORKING DAIRY :—				
Admissions				6 19 6
Entry Fees, Competitions .	30 2 0			22 18 0
,, Tests and Appliances	73 0 0			87 7 0
		103 2 0		110 5 0
Sale of Produce		108 7 7		108 8 2
Special Prizes, etc.		49 7 6		18 10 0
			260 17 1	244 2 8
CIDER :—				
Entry Fees and Fine			8 15 0	12 5 0
BOTTLED FRUIT :—				8 10 0
ADMISSIONS :—				
Admissions at 5s.		1,018 0 0		
,, ,, 4s.		6,720 4 0		3,580 0 0
,, ,, 2s. 6d. (Children) .		25 0 0		
,, ,, 2s.		5,400 2 0		2,354 10 0
,, ,, 1s. (Children) . . .		344 17 0		145 0 0
Season Tickets, etc.		541 11 3		158 0 0
			14,049 14 3	6,237 10 0
Carried forward		£	27,264 14 6	

CASH ACCOUNT—*continued*. CR.

PAYMENTS.	1921. Bristol. £ s. d.	1921. Bristol. £ s. d.	1920. Salisbury. £ s. d.
Brought forward		16,182 0 3	
CHEESE AND BUTTER:—			
Judges	9 17 0		9 18 9
Prizes	133 0 0		100 10 0
Stewards and Assistants	14 18 6		18 8 0
Shedding and Staging	142 16 0		114 11 8
Printing, Stationery, Carriage, etc.	9 4 6		7 5 4
		309 16 0	250 13 9
WORKING DAIRY:—			
Stewards and Assistants	68 8 5		68 6 6
Judges and Demonstrators	50 11 10		54 12 5
Buildings	502 7 5		441 0 2
Printing, Stationery, Postages, etc.	9 13 9		9 5 5
Utensils, Carriage, etc.	181 18 5		203 4 7
Prizes	60 14 0		61 11 6
Coal, Salt, Ice, etc.	15 15 9		10 10 4
Purchase of Milk	35 0 0		65 19 4
Analyses			22 5 6
		924 9 7	936 15 9
CIDER:—			
Shedding and Fittings	79 1 8		67 12 9
Steward and Assistants	22 15 8		25 8 7
Judge	3 3 0		4 11 0
Prizes	30 0 0		30 0 0
Analyses, Carriage, Printing, etc.	24 6 9		26 10 9
		159 7 1	154 3 1
BEES:—			
Grant to Beekeepers' Association		5 0 0	
BOTTLED FRUIT:—			18 0 10
PUBLIC ANNOUNCEMENTS:—			
Advertising	393 4 0		224 15 8
Billposting	400 0 0		309 19 3
Railway Placards	74 11 0		70 17 0
Printing	88 13 8		99 19 11
		956 8 8	705 11 10
Carried forward	£	18,537 1 7	

Dr.

CASH ACCOUNT—*continued.*

RECEIPTS.	1921. Bristol.						1920. Salisbury.		
	£	s.	d.	£	s.	d.	£	s.	d.
Brought forward				27,264	14	6			
SHOW (UNAPPORTIONABLE):—									
Sales, Fittings, etc.	861	18	10				396	16	8
Contract Premiums	642	2	2				365	0	0
Cloak Room and Lavatories	158	2	8				100	18	11
Guildford Local Committee Balance							19	15	2
				1,662	3	8	882	10	9
SUBSCRIPTIONS FROM TOWNS:—									
Plymouth for 1922 Show				800	0	0	800	0	0
				29,726	18	2	17,219	11	1
Deposit returned				5,000	0	0			
Balance in Bank, January 1st							56	17	9
„ due to Bank, December 31st				3,610	2	6	1,739	14	1
			£	38,337	0	8	19,016	2	11

CASH ACCOUNT—*continued*. Cr.

PAYMENTS.	1921. Bristol.						1920. Salisbury.		
	£	s.	d.	£	s.	d.	£	s.	d.
Brought forward				18,537	1	7			
SHOW (Unapportionable):—									
Official Buildings, etc.	3,947	16	2				3,058	14	3
Hoarding	593	2	6				144	6	3
Carriage of Plant	163	13	3				159	2	8
Stand Fittings	499	5	10				234	10	0
Insurance	110	19	10				54	19	0
Furnishing Official Buildings	66	11	10				17	7	6
Mess Room, Allotment Expenses, etc.	18	7	4				11	4	6
Gatekeepers, Yardmen, Messengers, etc.	156	1	2				163	9	4
Stewards of Finance and Treasurer	20	1	3				26	11	0
Secretary's and Finance Office and Treasurer's Clerks	91	9	7				78	6	11
Police							540	16	1
Badges, etc.	4	0	7				3	12	5
Catalogues for Press and Officials	12	1	0				11	10	6
Purchase of Plant	102	7	9				96	7	9
Printing, Stationery, etc.	153	16	1				89	1	11
Extension of Telegraph Wires and Telephone	120	13	2				50	11	4
Commission on Season Tickets	14	8	0						
Council Grant	50	0	0						
1922 SHOW:—				6,124	14	4	4,740	11	5
Timber	5,491	19	0						
Carriage and Stacking	1,260	7	0						
				6,752	6	0			
EXPERIMENTS:—									
Cider Institute				100	0	0	100	0	0
DEMONSTRATIONS ON ROUGH PASTURES—									
Steward and Officials	12	18	9						
Manures	34	5	11						
				47	4	8			
				31,561	6	7	18 982	2	11
Investments and Deposit				5,036	0	0	34	0	0
Balance due to Bank, January 1st.				1,739	14	1			
				£ 38,337	0	8	19,016	2	11

JANUARY 18TH, 1922.

I hereby certify that I have examined the foregoing accounts for the year ending December 31st, 1921, compared the payments entered with the vouchers, and found them all in order and correct.

F. CLIFFORD GOODMAN, F.C.A.,
Auditor.

Passed by Council,
January 31st, 1922.
F. H. STORR, Secretary.

ASSETS AND LIABILITIES ACCOUNT TO DECEMBER 31st, 1921, WITH COMPARISON FOR 1920.

ASSETS.	Par. Value.	Actual Cost	Market Value on Dec. 30	1921. Bristol.	1920 Salisbury.
	£ s. d.	£ s. d.	£ s d.	£ s. d.	£ s. d.
INVESTMENTS				13,666 7 10	12,453 11 0
New Zealand Stock .	1,568 1 6	1,500 0 0	1,129 0 3		
War Loan Stock .	4,099 11 1	5,809 19 6	3,781 16 9		
Ditto to replace capital lost by conversion .	189 6 9	175 8 3	174 13 3		
India Stock	7,538 15 1	7,277 5 1	3,882 9 2		
Queensland „	1.649 3 11	2,000 0 0	1,500 15 4		
N. S. Wales „	1,752 8 10	2,000 0 0	1,419 9 7		
Canadian PacificRly. „	1,500 0 0	1,576 2 6	1,042 10 0		
South Australian „	1,036 3 3	1,000 0 0	735 13 6		
	19,333 10 5	21,338 15 4	13,666 7 10		
FUND FOR REPLACEMENT OF CAPITAL.				41 15 9	36 17 10
INCOME TAX RECOVERABLE				78 17 9	78 17 9
SHOW PLANT				1,647 7 9	1,728 0 0
SHOW TIMBER				6,752 6 0	
HOUSE PROPERTY			633 10 7		633 10 7
FURNITURE AND FITTINGS			171 4 6		146 8 4
				804 15 1	779 18 11
SUBSCRIPTION ARREARS				59 6 0	43 12 0
JOURNAL SALES				2 10 0	2 10 0
			£	23,053 6 2	15,123 7 6

LIABILITIES.	1921. Bristol.	1920. Salisbury.
	£ s. d.	£ s. d.
PLYMOUTH MEETING . .	800 0 0	800 0 0
JOURNAL, cost of, estimated at .	550 0 0	550 0 0
DEFERRED PRIZES . .		11 0 0
DUE TO BANK . . .	3,610 2 6	1,739 14 1
DUE TO FUND FOR REPLACEMENT OF CAPITAL . .	41 15 9	36 17 10
BALANCE .	5,001 18 3 18,051 7 11	3,137 11 11 11,985 15 7
£	23,053 6 2	15,123 7 9

January 18th, 1922.

I hereby certify that I have audited the above Balance Sheet, and that, in my opinion, it is correct, and shows the true position of the Society's affairs according to the Books. The securities for the Society's Investments have been produced to me, and I have found them in order. The various Stocks have been valued by the Society's Bankers.

F. CLIFFORD GOODMAN, F.C.A., Auditor.

Passed by Council
January 31st, 1922,
F. H. STORR, Secretary

Bath and West and Southern Counties Society.

STATEMENT SHOWING FINANCIAL RESULT OF THE BRISTOL (1921) · SHOW.

Printed Financial Statements. Page		£	s	d	£	s	d.	£	s	d.
clxxviii	Show Receipts as per Summary . . .							27,516	13	10
clxxix	Show Payments as per Summary . . .				28938	2	3			
clxxxix	Less Show Plant purchased £102 7 9 Less 10 per cent. for depreciation . 10 4 9	92	3	0						
clxxxix	Less Timber for 1922 Show .	5,491	19	0						
	Carriage and Stacking	1,260	7	0						
					6,844	9	0			
								22093	13	3
	Net Profit on Show . . .						£	5,423	0	7

Bath and West and Southern Counties Society,

FOR THE

Encouragement of Agriculture, Arts, Manufactures and Commerce.

List of Members, 1922.

PATRON.

HIS MOST GRACIOUS MAJESTY THE KING.

PRESIDENT.

H.R.H. THE PRINCE OF WALES, K G.

DEPUTY PRESIDENT.

THE RIGHT HON. THE LORD CLINTON.

TRUSTEES.

THE MOST HON. THE MARQUIS OF BATH, K.G.
C. L. F. EDWARDS, ESQ.
SIR J. SHELLEY, BART.

Names thus (*) distinguished are Governors.
Names thus (†) distinguished are Life Members.
*** *Members are particularly requested to make the Secretary acquainted with any errors in the names or residences.*

Name	Residence	Sub-scriptions		
		£	s.	d.
*†His Most Gracious Majesty the King	Windsor Castle		..	
Ackers, Chas. P.	Huntley Manor, Gloucester	1	0	0
Ackland, J.	Francis Court, Broadclyst, Exeter	1	0	0
Acland, Alfred Dyke	. . . .	1	0	0
†Acland, Right Hon. Sir Arthur H. Dyke	85, Onslow Square, London, S.W.7		..	
Acland, Right Hon. F. Dyke, M.P.	93, Bedford Gardens, Campden Hill, London, W.	1	0	0
Adams, E. C.	Brentwood, Combe Down, Bath	1	0	0
Adlam, J. C.	Manor Farm, East Horrington, Wells	1	0	0

Name	Residence	Sub-scriptions		
		£	s.	d.
Aitken, Brig.-Gen.	3, Catherine Place, Bath	1	0	0
Akers, E.	16, Victoria Park Road East, Cardiff	1	0	0
*Albany, H.R.H. The Duchess of	Claremont, Esher	2	0	0
Alexander, D.	Cardiff	1	1	0
Alexander, H. G	Dinas Powis, Cardiff	1	1	0
Allen, A.	Chesterblade, Shepton Mallet	1	1	0
Allen & Foster	Corn and Seed Merchants, Shepton Mallet	1	1	0
Allen & Sons	Cheese Merchants, Shepton Mallet	1	1	0
†Allen, Miss Ida Helena	Springfield House, Shepton Mallet		..	
Allen, W. T.	Bradley House, West Pennard, Bridgwater	1	0	0
Allott, Major P. B.	Little Ashton, Codford, Wilts	1	0	0
Allsebrook, A.	Link Elm, Malvern Link	1	1	0
Amesbury, A.	Loxton, Axbridge	1	1	0
Angerstein, J. R.	Holbrook House, Wincanton	1	0	0
Anglo-Continental Guano Works	Dock House, Billiter Street, E.C.3	1	0	0
Anglo-Swiss Condensed Milk Company	Chippenham	1	0	0
*Ansdell, C. W.	Leckford Abbas, Stockbridge, Hants	2	0	0
Anthony, A.	Bryn Garth Piggeries, Bryn Garth, Hereford	1	0	0
Armitage, F.	Dean Court, Taunton	1	1	0
Armitage, Mrs.	Dene Court, Taunton	1	1	0
Armstrong, E.	The Lawn, Nailsea, near Bristol	1	0	0
†Ashcomb, Lord	Denbies, Dorking		..	
†Ashcroft, W.	13, The Waldrons, Croydon		..	
Asher, S. G.	Ascot Place, Ascot	1	0	0
Associated Manufactures Co.	72-80, Mansell Street, Aldgate, E.1	1	0	0
*Astor, Lord	Cliveden, Taplow, Bucks	2	0	0
Atkinson, Brig.-Gen. B., C.B., C.M.G.	Mistley Hall, Manningtree, Essex	1	0	0
Austin, E. A.	Baltonsborough, Glastonbury	1	1	0
†Avebury, Lord	High Elms, Hayes, Kent		..	
†Aveling, Thomas L.	Rochester		..	
Avery, N.	Markham Farm, Easton in Gordano, Bristol	1	0	0
Avon Manure Company (Ld.)	St. Philip's Marsh, Bristol	1	0	0
Badcock, H. Jefferies	Broadlands, Taunton	1	0	0
Badock, S. H.	Holmwood, Westbury-on-Trym, Bristol	1	0	0
Bagnall, O. R.	The Howsells, Malvern Link	1	0	0

Name	Residence	Sub-scriptions		
		£	s.	d.
Bainbridge, Mrs. R. C.	Elfordleigh, Plympton, Devon	1	0	0
†Baker, Hiatt C.	Oaklands, Almondsbury	..		
Baker, G. E., J.P.	The Old House, Freshford, Bath	1	1	0
Baker, G. E. Lloyd	Hardwicke Court, Gloucester	1	0	0
†Baker, M. G. Lloyd	The Cottage, Hardwicke, Glos.	..		
Ball, A. E.	Coulston House, Westbury, Wilts	1	0	0
Bamfords (Ltd.)	Uttoxeter	1	0	0
Barford and Perkins (Ltd.)	Peterborough	1	0	0
Barham, G. T.	Sudbury Park, Wembley, Middlesex	1	0	0
Baring, Hon. A. H.	The Grange, Alresford, Hants	1	0	0
*Barker-Hahlo, H.	Camerton Court, Bath	2	0	0
Barnes, Major-Gen. Sir R. W. R., K.C.B., D.S.O.	Oakhay, Stoke Canon, near Exeter	1	0	0
Barry, Major A. P.	Baltonsborough, Glastonbury	1	0	0
Barstow, J. J. J.	The Lodge, Weston-super-Mare	1	1	0
Barton, D. J.	Bodrean, Truro, Cornwall	0	10	0
Barton, W. L.	Easton House, Corsham	1	0	0
Bassett, A. F.	Tehidy, Camborne, Cornwall	1	0	0
Bastard, H. E.	Tinten Manor, St. Tudye, S.O., Cornwall	1	0	0
Bates & Scholes	Victoria Iron Works, Denton, Manchester	1	0	0
Bath, Major R.	Glastonbury	1	0	0
*†Bath, Marquis of, K.G.	Longleat, Warminster	..		
Bath and Somersetshire Dairy Co. (Ltd.)	Bath	1	0	0
Bath Brewery Co. (Ltd.)	Argyle Street, Bath	1	0	0
Bath Gas Company	Bath	1	0	0
Bathurst, F. Marlay	The Warren, Lydney, Gloucestershire	1	0	0
Bathurst, Hon. B. L.	Lydney Park, Gloucestershire	1	1	0
Bathurst, Lady Hervey	Somborne Park, Stockbridge	1	1	0
Bathurst, Sir F. Hervey, Bart., D.S.O.	Somborne Park, Stockbridge, Hants	1	1	0
Batt, R.	Clapton, Ston Easton, Bath	1	0	0
Batt, T. T.	West Hill, Heytesbury	1	0	0
*†Batten, Major H. C., D.S.O.	Aldon, Yeovil	..		
Batten, Col. Cary	Abbotsleigh, Bristol	1	0	0
Batten-Pooll, R. H.	Road Manor, Bath	1	0	0
†Baxendale, J. Noel	Froxfield Green, Petersfield	..		
Beak, J. D.	Maiden Bradley, Bath	1	0	0
Beauchamp, E. B.	Trevince, Redruth	1	0	0
Beauchamp, L. B.	Norton Hall, near Bath	1	0	0
Beauchamp, Sir F. B.	Woodborough House, Peasedown St. John, Bath	1	1	0
*Beaufort, Duke of	Badminton, Chippenham	2	2	0
Beaufoy, M. H.	Coombe Priory, Shaftesbury	1	0	0
Bell, Lieut.-Colonel M. G. E.	Bourne Park, near Canterbury	1	0	0
Bell, Sir Jas.	Bellfield, Willerby, Hull	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Benett-Stanford, Capt. J.	Hatch House, Tisbury	1	0	0
Bennett, Brothers	*Journal* Office, Salisbury	1	1	0
Bennett, R. A.	Thornbury, Glos.	1	0	0
Bentall, Edward H. & Co.	Heybridge, Maldon, Essex	1	0	0
Benyon, H. A.	Englefield House, Reading	1	1	0
*Benyon, J. Herbert	Englefield House, Reading	5	0	0
Berry, A. E.	Rowgardens Wood, Charlwood, Surrey	1	0	0
Berry, Grosvenor	Mount Bures, Bures, Suffolk	1	0	0
Berry, H. W.	Blackmoor Farm, Langford, near Bristol	1	0	0
Berryman, F. H.	Field House, Shepton Mallet	1	1	0
Bessant, W.	Skinners Farm, Woolland, Blandford, Dorset	1	0	0
Best, Major T. G.	East Carleton Manor, Norwich	1	0	0
†Best, Capt. W.	Vivod, Llangollen, North Wales		..	
Best, Hon. J. W.	Charlton House, Ludwell, Salisbury	1	0	0
Beverley, Ringer A.	Swardeston, Norfolk	1	0	0
Beynon, Sir J. W., Bart., C.B.E.	Merthyr House, Cardiff	1	1	0
Biddle, W. F.	Parsonage Farm, Butleigh, Glastonbury	1	0	0
Bird, Kelly	Walton Farm, Walton, near Bridgwater	1	0	0
Birkett, E.	Biddlestone Farm, Brooke Ashford, Kent	1	0	0
Birmingham, C.	Nutscale, The Parks, Minehead	0	10	0
Bishop, B. G.	Roddimore, Winslow, Bucks	1	1	0
Bishop, G., M.R.C.V.S.	Scotland House, Brislington, Bristol	1	0	0
†Blackburn, H. P.	Donhead Hall, Salisbury		..	
Blacker, E. G.	Northend Farm, Clutton	1	0	0
†Blackstone, G. M.	Blackstone & Co., Ld., Stamford		..	
Blake, Col. M. Lock	Bridge, S. Petherton	1	0	0
Bland, V. S.	Estate Office, Foxhill, Wanborough, Wilts	1	0	0
Blandy, Capt. S. H. B.	Ivythorn Manor, Street, Somerset	1	0	0
Blathwayt, R. W.	Dyrham Park, Chippenham	1	1	0
Blathwayt, Rev. W. E.	Dyrham Rectory, Chippenham	1	0	0
†Bledisloe, Lord, K.B.E.	Lydney Park, Gloucester		..	
Bledisloe, Lady	Lydney Park, Gloucester	1	1	0
Blinman, F. R.	Auctioneer, Farington Gurney, Bristol	1	0	0
Blinman H. T.	Auctioneer, Farington Gurney, Bristol	1	0	0
Board, W. R.	Great Frampton, Llantwit Major, Cardiff	1	0	0
Body, J. B.	Hindhead Court, Hindhead, Surrey	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Boles, Lt.-Col. Dennis F., C.B.E., D.L.	Watts House, Taunton	1	0	0
Bolitho, R. F.	Ponsandane, Penzance	1	1	0
Bolitho, T. R.	Trengwainton, Hea Moor, Cornwall	1	1	0
Bond E. (W. Evans & Co.)	Hele, Cullompton	1	0	0
Boscawen, Rev. A. T.	Ludgvan Rectory, Long Rock, R.S.O., Cornwall	1	0	0
Boscawen, Townshend E.	2, Old Burlington St., London, W.1	1	0	0
Bouverie, H. P.	Brymore, Bridgwater	1	0	0
†Bowen-Jones, Sir J., Bart.	The Woodlands, Bicton, near Shrewsbury		..	
†Bowerman, Alfred	Sydney Villa, Broadclyst, Exeter		..	
Braby, F. & Co., (Ltd.)	Ashton Gate Works, Bristol	1	0	0
Bracey, W.	Manor House, Martham, Great Yarmouth	1	0	0
Bracher, G. R.	Heathermead, Stone, near Falfield, Glos.	1	1	0
Bradford, Thomas & Co.	Salford, Manchester	1	0	0
*Braithwaite, T. S.	Durley Hill, Keynsham, Somerset	2	0	0
Branch, H. S.	West End, Foxham, Chippenham	1	0	0
Brasnett, A. W.	Veterinary Surgeon, Wells	1	0	0
*†Brassey, H. L. C.	Apethorpe Hall, Wansford, Northants		..	
†Brassey, Capt. R. B.	Heythrop, Chipping Norton, Oxon		..	
Bray, F. W. J.	Portway, Wells	1	0	0
Brenton, W. (Ltd.),	St. Germans, Cornwall	1	0	0
*Bridges, Agricultural Engineers	Whiteway Works, Cirencester	2	0	0
Bridges, J. H.	The Court, Eastbourne	1	1	0
Bridgman, C.	Conigre Farm, Filton, near Bristol	1	0	0
Bridgman, H.	Cleve Hill Farm, Downend, Bristol	1	1	0
†Brinkley, Rev. W. F. B.	The Vicarage, Abbots Leigh, Bristol		..	
Bristol Times and Mirror, Proprietors of	Bristol	1	0	0
Bristol Wagon & Carriage Works Co., (Ltd.)	Bristol	1	1	0
Britten, Forester	Kenswick Manor, Worcester	1	0	0
Britton, W. C.	Dungeon Farm, Croscombe	1	0	0
†Brocklehurst, H. D.	Sudeley Castle, Winchcombe		..	
Brockman, F. D.		1	0	0
Broughton, B. R.	Manor Farm, North Perrott, Crewkerne	1	0	0
Brown, F. E.	1,403, Neath Road, Swansea	1	0	0
Brown, T., and Son	Marham Hall, near Downham, Norfolk	1	0	0
Browning, Albert	The Homestead, Combe Park, Bath	1	1	0
Browning, T.	Nash End Farm, Eastington, Stonehouse, Glos.	0	10	0

Name	Residence	Subscriptions £	s.	d.
Browning, W.	Nash End Farm, Eastington, Stonehouse, Glos.	0	10	0
†Bruford, E. J.	Nerrols, Taunton		..	
Bruford R.	Nerrols, Taunton	1	0	0
Brymer, W. J.	West Down Lodge, Winchester	1	0	0
Buchanan, W. G.	Manor House Farm, Abergavenny	1	0	0
Buck D.	White House, Little Mill, Pontypool	1	0	0
Buckingham, Rev. C. L.	Rotherfield, Sussex	1	1	0
†Buckingham, Rev. Preb.	The Rectory, Doddiscombsleigh, Exeter, Devon		..	
Buckingham. Capt. F. R	Doddiscombsleigh, Exeter	1	0	0
Buckley, S. W.	Danygraig, Pembrey	1	0	0
Budd. Felix S.	Clarendon House, Stow Park, Newport, Mon	1	0	0
Budd, J. E.	Tidebrook Manor, Wadhurst, Sussex	1	0	0
Bullows, Miss M. A.	Metchley, Barlows Road, Edgbaston, Birmingham	1	1	0
Burdge, J.	Claverham, near Bristol	1	0	0
Burdge, J. H.	Yatton, near Bristol	1	0	0
Burghclere, Lord	48, Charles Street, London, W.	1	0	0
Burnard & Algar	Plymouth	1	0	0
Burrell, C. and Sons	St. Nicholas Works, Thetford	1	0	0
*Burrell, Sir M. R., Bart.	Knepp Castle, Horsham, Sussex	2	0	0
†Bush, H. G.	The Grove, Alveston, Glos.		..	
Bush, Mrs. L. E.	St. Mary's, Atlantic Road South, Weston-s-Mare	1	1	0
Busk, W. G.	Wraxall Manor, Cattistock, Dorset	1	0	0
*Bute, The Marquis of	The Castle, Cardiff	2	0	0
Butler, W.	Gatcombe Farm, Flax Bourton, Bristol	1	0	0
Cable, Lord	Lindridge, near Teignmouth	1	1	0
Cæsar, H. and J.	Knutsford, Cheshire	1	0	0
Calmady-Hamlyn, Miss M.B.E.	Bidlake Vean, Bridestowe, Devon	1	0	0
Campbell, J.	31, St. Albans Road, Swansea	1	0	0
Candy, T. C.	Woolcombe, Cattistock, Dorset	1	0	0
Candy, W. T.	Beryl Farm, Wells	1	0	0
Candy, H. J.	Upper Lodge Farm, Ston Easton, Bath	1	0	0
Carew, C., M.P.	Collipriest, Tiverton	1	0	0
Carnarvon, Earl of	Highclere Castle, Newbury	1	1	0
†Carruthers W., F.R.S.	14, Vermont Road, Norwood, London, S.E.		..	
Carter, A. H.	Albion Chambers, Bristol	1	0	0
†Carter, E.	East Upton, Ryde, Isle of Wight		..	

Name	Residence	Subscriptions		
		£	s.	d.
Carter, G. V.	Waterston Manor, Dorchester	1	1	0
Carter, W. H. F.	Chewton Mendip.	1	0	0
Carter. J. & Co.	Raynes Park, London, S.W.	1	0	0
Cartridge, W. T. B.	Sidbury, Worcester	1	0	0
Cartwright, T. G.	30, Beaufort Gardens, London, S.W.	1	0	0
Cary, Edmund	Pylle, Shepton Mallet	0	10	0
†Cary, John	The Priory, Shepton Mallet		..	
†Cary, W. H.	Clifton Club, Clifton, Bristol		..	
Cattybrook Brick Co. (Ltd.)	Provident Buildings, 15, Clare Street, Bristol	1	0	0
Cave, Captain A. L.	Sherwood, Newton St. Cyres, Exeter	1	0	0
Cave, Sir C., Bart.	Sidbury Manor, Sidmouth	1	0	0
Cave, C. H.	Rodway Hill House, Mangotsfield, Bristol	1	0	0
Chamberlain, T. A.	The Batch, Flax Bourton, Bristol	1	0	0
Chapman, W. W.	Mowbray House, Norfolk Street, Strand, London, W.C.2	1	1	0
Chatterton & Ord	Hunting Stables, Marston Magna	1	0	0
Chichester, Major C. H.	Hall, Bishops Tawton, Barnstaple	1	0	0
Chichester, H.	Verbere, Willand, Cullompton	1	0	0
†Chick, J. H.	Wynford Eagle, Maiden Newton. Dorset		..	
†Chick, W. D.	Compton Valence, Dorchester		..	
Chinneck and Blunt	Trobridge House, Crediton	1	0	0
Chivers and Son	Histon, Cambridge	1	0	0
Christie, A. L.	Tapeley Park, Instow, N. Devon	1	1	0
Christie-Miller, S. R.	Clarendon Park, Salisbury	1	0	0
Churchill, The Viscount, G.C.V.O.	Carlton Club, Pall Mall, London, S.W.1.	1	0	0
†Churchward, F.	Hill House, Stoke Gabriel, near Totnes		..	
Clancy, D.	Lower Knowle, Bristol	1	0	0
Clancy, M.	Kingshill House, Knowle, Bristol	1	0	0
Clare, A. J.	Beach Hill, Wells	1	1	0
*Clarendon, Earl of	The Grove, Watford	2	2	0
†Clark, C. S.	Tracy Park, Near Bath		..	
Clark, H.	North Wootton, Shepton Mallet	1	0	
Clark, H. A.	Hinton Field, Hinton Charterhouse, Bath	1	0	0
Clark, H. B.	Butleigh, Glastonbury	1	0	0
†Clark, J. J.	Goldstone Farm, Hove, Sussex (Hon. Local Sec., 1885)		..	
Clark, W. S.	Street, Glastonbury	1	0	0
Clark, W. H.	RutlandCottage,CombeDown,Bath	1	1	0
Clarke, J. W.	Bridwell, Cullompton	1	0	0
Clerk, Lieut.-Col. R. M.	Charlton House, Shepton Mallet	1	0	0
*Clifden, Viscount	Lanhydroc, Bodmin	2	0	0
Clinton, Lord	Bicton, East Budleigh E. Devon	1	0	0

Name	Residence	Sub-scriptions £	s.	d.
Clive, Capt. E. A. B.	Brympton, near Yeovil, Somerset	1	0	0
Clutton, R. W.	Hartswood, Reigate	1	0	0
Coaker, J.	Blagdon Barton, Paignton, Devon	0	10	0
Cobb, H. M.	Higham, Rochester	1	0	0
Cobb, R.	Larkin Hall, near Rochester	1	0	0
Cole, J. J. B.	Combe Manor, Hungerford	1	0	0
Colebrook, H. J.	South Lodge, Ivor Heath, Bucks.	1	0	0
Coleridge, Hon. G. D.	The Chanter's House, Ottery St. Mary, Devon	1	0	0
Collet, Sir Mark, Bart.	St. Clare, Kemsing, Sevenoaks	1	1	0
Collins, A. H.	Manor Farm, Codford St. Peter, Wilts	1	0	0
Collins, J. S.	St. George's Lodge, Oldfield Park. Bath	1	1	0
Colman, Sir J., Bart.	Gatton Park, Surrey	1	0	0
Colmer, Jas. (Ltd.)	Union Street, Bath	1	0	0
Colston, Lieut.-Col. the Hon. E.	Hamilton House, Ashburn Place, S.W.7	1	0	0
Colville, H. K.	Hillmarton Lodge, Calne, Wilts		0	0
Combes, D. Jn., C. C.	Manor Farm, Dinton, Salisbury		0	0
Cook, R.	Widhayes, Tiverton		0	0
Cookson, Mrs. Freville	Chute Standen, Andover		0	0
Cookson, Miss W.	Chute Standen, Andover		0	0
Cooling, G. and Sons	Northgate Street, Bath		1	0
Cooper, Sir G., Bart.	Hursley Park, Winchester		0	0
Cooper, Major R. W.	Eling House, Hermitage, Berks		0	0
Coote, Lady Eyre	West Park, Damerham, Salisbury		0	0
Cope, W.	Southerndown, Glam.		1	0
Corbet, E. W. M.	Bute Estate Office, Cardiff		1	0
Corbett, S. E.	Perseverance Iron Works, Shrewsbury	1	0	0
†Cork and Orrery, The Earl of			..	
Cornelius, R.	Lutwicke Hall, Much Wenlock, Salop	1	0	0
†Corner, H. W.	Manor House, Inglescombe, Bath		..	
Cornish, Dr.	Pixford, Taunton	1	0	0
†Cornwallis, F. S. W.	Linton Park, Maidstone		..	
Corp R.	Woodford Farm, Wells	1	0	0
Cory, Sir Clifford, J., Bart., M.P., D.L.	Llantarnam Abbey, Mon.	1	0	0
†Cotterell, Sir J. R. G., Bart.	Garnons, Hereford		..	
Cotton, R. W.	Baltonsborough, Glastonbury	1	0	0
Coultas, J. R.	Allington, near Grantham	1	0	0
Coultrip, A. W.	Norwood Manor, East Church, Kent	1	0	0
†Courage, Raymond	Shenfield Place, Brentwood, Essex		..	
Cousins, Chas.	Jenkins, Stisted, Braintree, Essex	1	0	0
†Coussmaker, Lt.-Col. G.	Westwood, Normandy, Guildford, Surrey		..	

Name	Residence	Sub-scriptions £	s.	d.
*Coventry, The Earl of	Croome Court, Worcester	2	0	0
Cox, B.	Pwlpen Farm, Christchurch, Newport, Mon.	0	10	0
Cox & Sons	47, City Road, Cardiff	1	0	0
Criddle, A. M. B.	Worle, Weston-super-Mare	1	0	0
Cridlan, J. J.	Maisemore Park, Gloucester	1	0	0
Croad and Brown	Branch of British Oil & Cake Mills, Bridgwater	1	1	0
Croker, O.	Grapnell Farm, Dinder, Wells	1	0	0
Cross, F. R.	Worcester House, Clifton	1	1	0
*Cross, Carlton	Wyke Hall, Gillingham	2	0	0
Crossman, A.	Ivythorn, Street, Somerset.	1	0	0
Crossman, B.	Chestnut Farm, Claverham, near Bristol	1	1	0
Crossman D.	Lower Farm, West Horrington, Wells	1	0	0
Crossman, H. H.	Ham Farm, Yatton	1	0	0
Crowdy, A. A. G.	Manor Farm, East Horrington, Wells	1	0	0
Crutchley, P. E.	Limminghill Lodge, Ascot	1	0	0
Cumber, W. J.	Theale, Berks	1	0	0
Cuming, A. P.	Moreton Hampstead, Devon	1	0	0
Cundall, H. M., I.S.O., F.S.A.	4, Marchmont Gardens, Richmond Hill, Surrey	1	0	0
†Curre E.	Itton Court, Chepstow		..	
Currie, L.	Minley Manor, Farnborough, Hants	1	0	0
Dairy Supply Company (Ltd.)	Museum St., Bloomsbury, London, W.C.9	1	0	0
Dale, T. F.	Brush End, Burley, Hants.	1	0	0
Dalrymple, Major F. B.	Bartley Lodge, Cadnam, Hants	1	0	0
†Daniel, H. T.	The Red House, Cannington, Bridgwater		..	
Daniel, Thos. C.	Stuckeridge, Bampton, North Devon	1	1	0
Darby, A. E. W.	Little Ness, Shrewsbury	1	0	0
Darby, E.	Liscombe, Dulverton	1	0	0
†Darell, D.	Hillfield House, Stoke Fleming, near Dartmouth		..	
†Davey, J. Sydney	Brockym, Cury-Cross-Lanes, Cornwall		..	
Davey, Sleep & Co. (Ltd.)	Excelsior Plough Works, Plymouth	1	0	0
†Davey, T. R.	Wraxall Court, Near Bristol		..	
David & David	Old Bank Chambers, 27, High Street, Cardiff	1	0	0
Davies, D.	The Borough Stores, College Street, Swansea	1	1	0

Name	Residence	Subscriptions		
		£	s.	d.
Davies, L. F.	Frenchay Lodge, Frenchay, near Bristol	1	0	0
Davies, P. G.	Frenchay Lodge, Frenchay, near Bristol	1	0	0
Davies, R.	Frenchay Lodge, Frenchay, near Bristol	1	0	0
Davies, W.	Highfield, Llanelly	1	0	0
Davis, E. K.	Little Stoke, Patchway, near Bristol	1	0	0
†Davis, H. J.	Sutton Montis, Sparkford, S.O., Somerset		..	
Davis, J.	Manor Farm, Hendon, Wells	1	0	0
Davis & Co.	75, George Street, Oxford	1	0	0
Daw, J. E.	4, Louisa Terrace, Exmouth	1	1	0
Dawnay, Major-Gen. G. F.	Longparish House, Whitchurch, Hants	1	0	0
Day & Sons (Ltd.)	Crewe	1	0	0
*†Debenham E. R.	Morton House, Near Dorchester		..	
Debenham, H.	Buckland House, Buckland St. Mary, Taunton	1	0	0
De Bertodano, B.	Cowbridge House, Malmesbury	1	0	0
De Hamel, E.	Middleton Hall, Tamworth	1	0	0
Demuth, R. H.		1	0	0
Dening, C. & Co.	Chard, Somerset	1	0	0
Dennis, S.	Latton, Cricklade, Wilts	1	0	0
†Devas, H. G.	"Nizels," Hildenborough, Tonbridge		..	
Devenish, H. N.	Little Dunford, Salisbury	1	0	0
*Devon, The Earl of	Powderham Castle, Devon	2	0	0
*Devonshire, Duke of	Chatsworth, Derbyshire	5	0	0
Dickinson, W. F.	Kingweston, Somerton	1	0	0
Dickson & Robinson	Cathedral Street, Manchester	1	1	0
*Digby, Capt., The Lord, D.S.O., M.C. (Coldstream Guards)	Minterne, Cerne Abbas	2	0	0
Digby, F. J. B. Wingfield	Sherborne	1	0	0
†Dobson, H. V.	Bath & County Club, Bath		..	
Dodington, R. M.	Horsington Park, Templecombe	1	0	0
Dormer, Capt. C. W. C.	Rousham, Oxford	1	0	0
Dors, J. C.	Hunters Lodge, Wells	1	0	0
*Douglas, J.	Hanham Road, Kingswood, near Bristol	2	0	0
Down, G. W.	Failand Lodge, Failand, near Bristol	1	1	0
Down, H. E.	Middle Farm, Dinder, Wells	1	0	0
Drummond, Col. F. D. W., C.B.E.	Cawdor Estate Office, Carmarthen	1	0	0
Drummond, Brig.-Gen. H. W.	Board Room, L. & S.W.R., Waterloo Station, London	1	0	0

Name	Residence	Subscriptions £	s.	d.
Duchesne, M. C.	Farnham Common, Slough, Bucks		0	0
Duck, W. G.	Neadwood, Christon, near Exeter		1	0
Duckworth, Major A. C.	Orchardleigh Park, Frome		0	0
Dugdale, Major J. G.	The Abbey, Cirencester		0	0
Dugdale, W. M.	Llwyn, Llanfyllin		1	0
Duncan, R.	Rhoose, near Barry	1	0	0
Dunlop, I. M.	Avonhurst, Sneyd Park, Bristol	1	0	0
Eagle Range and Gas Stove Company (Ltd.)	Catherine St., Aston, Birmingham	1	0	0
Eastwood, A. C.	Leigh Court, Taunton	1	0	0
*†Eastwood, J. E.	Wade Court, Havant		..	
Eaton, G. T.	Thurston Hall, Framfield, Sussex	1	0	0
Economic Fencing Company (Ltd.)	Billiter House, Billiter Street, London, E.C.3	1	0	0
Eden, R. H. H.	Heytesbury, Wilts	1	0	0
†Edgcumbe, Sir Robert Pearce	. . . .		..	
*Edge, S. F.	Gallops Homestead, Ditchling, Sussex	2	2	0
†Edmondson, A.	Woodclose, Silverdale, Lancashire		..	
Edmunds, L.	Cholderton, Salisbury	1	0	0
Edwards, A. P.	Gog's House, Wedmore, Somerset	1	1	0
Edwards, C. L. Fry	The Court, Axbridge, Somerset	1	0	0
Edwards, R. G.	Burrington Vicarage, Bristol	1	1	0
Edwards, W. H. G.	Butcombe Court, Wrington	1	0	0
*Edwards-Ker, D. R. O.B.E., M.A.,	Principal, Seale Hayne Agricultural College, Newton Abbot	2	0	0
Eldridge, Pope & Co.	Dorchester	1	0	0
Elliott, T. M.	Biddestone, Chippenham	1	1	0
Elton, B. A.	Clevedon Court, Somerset	1	0	0
Elwes, Lt.-Col. H. C., D.S.O., M.V.O.	Colesborne, Cheltenham	1	1	0
Elwes, P. B.C.,	Somerton, Somerset	1	0	0
Emmet, Mrs. R.	66, Grosvenor Street, London, W.	1	0	0
Ensor, T. & Sons	Auctioneers, Dorchester	1	0	0
Errington, R.	Victoria Mills, Sunderland	1	0	0
Esdaile, C. E. T.	Cothelstone House, Taunton	1	0	0
*Esplen, Sir John, Bart.	Hardres Court, Canterbury	2	0	0
Evans, E. W.	Crickleaze House, Chard	1	0	0
Evans, H. M. Glynn	Plasissa, Llangennech, Carmarthenshire	1	0	
Evans, Thomas	Berkeley Villa, St. James's Garden, Swansea	1	0	
†Evan-Thomas, Commander A.	Caerwnon, Builth Wells, R.S.O.		..	

Name	Residence	Subscriptions		
		£	s.	d.
Evan-Thomas, Vice-Admiral Sir Hugh . . .	Redlap House, Dartmouth . .	1	0	0
†Eve, Mr. Justice . .	Royal Courts of Justice, London, W.C.2		..	
Evelyn, Mrs. . . .	Wotton House, near Dorking .	1	0	0
Eyles, T. W. . . .	Ashley Wood, Kingsdown, Box, Wilts	1	1	0
Ezra, E.	Lock, Partridge Green, Sussex .	1	0	0
*†Falmouth, Viscount .	Tregothnan, Truro		..	
Fane, Captain H. N. . .	Boyton Manor, Codford, Wilts .	1	0	0
†Farmer, S. W. . .	Little Bedwyn, Wilts . .		..	
Farrant, A. H. . . .	Baltonsborough, Glastonbury .	1	0	0
Farrow, E. J. . . .	11, Nicholas Street, Bristol .	1	0	0
†Farwell, Major E. W. .	Hylton Estate Office, Kilmersdon, Bath		..	
Fastnut (Ltd.) . . .	Beehive Wharf, Brentford, Middlesex	1	1	0
Faudel-Phillips, Major H. .	Stoney Ware, Marlow . .	1	0	0
Fawcett, E. C. . . .	16, Chamberlain Street, Wells .	1	0	0
Feaver, A. . . .	Coal, Cake and Corn Merchant, Evercreech	1	0	0
Fenton, A. D. . . .	Maristow, Roborough, S. Devon .	0	10	0
Fenwick, M. . . .	Abbotswood, Stow-on-the-Wold .	1	0	0
*Ferguson-Davie, Sir W.J.,Bt.	Creedy Park, Crediton . .	2	0	0
Ferrand, G. F. . . .	Morland Hall, Alton, Hants .	1	0	0
Fewtrell, O. J. . . .	Estate Office, Wells . . .	1	0	0
Finlay, Col. Alexander .	Little Brickhill, Bletchley, Bucks .	1	0	0
Finn, L. & G. . .	Westwood Court, Faversham, Kent	1	0	0
Fison, J. & Co. . .	Ipswich	1	0	0
*Fitzgerald, Lady . .	Buckland, Faringdon, Berks .	2	0	0
Fleming, J. Willis . .	Stoneham Court, Eastleigh, Hants	1	0	0
Flower, A. A. . . .	Crox Bottom Farm, Bishopsworth, Bristol	1	0	0
Flower, James . . .	Chilmark, Salisbury . . .	1	0	0
Flower, T. . . .	Inns Court Farm, Bishopsworth, Bristol	1	0	0
Flower, W. . . .	72, Stapleton Road, Bristol . .	1	0	0
*†Folkestone, Viscount .	Longford Castle, Salisbury .		..	
*†Forester, Capt. F. W. .	Saxilbye Park, Melton Mowbray .		..	
Forrest, Col. W. . .	St. Fagan's, Cardiff . . .	1	0	0
Forster, J. C. . . .	Clatford Mills, Andover . .	1	0	0
Fortune, R. . . .	Newhouse, Cranleigh, Surrey .	1	0	0
†Fortescue, J. B. . .	Boconnoc, Lostwithiel, Cornwall		..	
Four Oaks Spraying Machine Co. (Ltd.) . . .	Four Oaks Works, Sutton Coldfield	1	1	0
Fowler & de la Perrelle .	Porter's Lane, Southampton .	1	0	0

Name	Residence	Sub-scriptions		
		£	s.	d.
Fowler, J. & Co. (Ltd.)	Leeds	1	0	0
Fox, Brothers & Co.	Wellington, Somerset.	1	1	0
Fox, C. L.	Rumwell Hall, Taunton	1	0	0
Fox, Mrs. A.	Brislington House, near Bristol	1	0	0
†Fox, Robert	Grove Hill, Falmouth		..	
Fox, R. A.	Yate House, Yate, Glos.	1	1	0
Foxcroft, C. T., M.P.	Hinton Charterhouse, Bath	1	1	0
Francis, Major O. L.	Downton, Salisbury	1	1	0
Freeman, T. R & Sons	Monkton Combe Mills, Bath	1	1	0
*Fremlin, W. T.	Milgate Park, Maidstone	2	0	0
Frost, E. J.	Fountain Farm, Dulcote, Wells	1	0	0
Frost, W.	The Red House, Almondsbury, Glos.	1	1	0
Fry, A. M.	8, Zion Hill, Clifton, Bristol	1	1	0
Fry, Cecil	Grove House, Frenchay, Bristol	1	0	0
Fry, C. A. H.	Ashton Lodge, Long Ashton	1	0	0
*Fry, J. S. & Son (Ltd.)	Union Street, Bristol	2	2	0
†Fuller, G. Pargiter	Neston Park, Corsham		..	
*Fuller, Major R. F.	Great Chalfield, Melksham	2	0	0
Fuller, S. & A.	Bath	1	0	0
Fursdon, E. S.	Hevers, Mont le Grand, Heavitree, Exeter	1	1	0
Gale, G.	The Grove, Winterbourne, near Bristol	1	0	0
Galloway, J.	Sharcombe Park, Dinder, Wells, Somerset	1	1	0
Gane, P. J.	Higher Rocke Farm, Butleigh, Glastonbury	1	0	0
Gantlett, W. R. & Son	Manor Farm, Fairford, Glos.	1	0	0
Gardiner, Sons & Co.	Nelson Street, Bristol	1	1	0
Garne, W.	Aldsworth, Northleach	1	1	0
Garne, W. T.	Aldsworth, Northleach	1	1	0
Garrett, W.	Backwell Hill House, West Town, R.S.O., Somerset	1	0	0
Gazzard, M. H.	Sanager Farm, Sharpness, Berkeley	1	0	0
Genge, M.	Stop Farm, Fonthill Gifford, Tisbury	1	1	0
Gibbins, T.	Glynfelin, Neath	1	1	0
†Gibbons, H.	The Model Farm, King's Langley, Herts		..	
Gibbons, P. F., J.P.	Keynsham	1	1	0
Gibbs, A. H.	Pytte, Clyst St. George, Topsham Deven	1	0	0
*†Gibbs, Lt.-Col. G. A., M.P.	Tyntesfield, Bristol		..	
Gibbs, G. M.	Gratwicke Hall, Flax Bourton	1	0	0
Gibbs, Lt.-Col. W. O.	Chippenham	1	0	0

Name	Residence	Subscriptions £	s.	d.
†Gibbs, H. M.	Barrow Court, Flax Bourton, Bristol		..	
Gibbs, Mrs.	Pytte, Clyst St. George, Topsham, Devon	1	0	0
Gibson, J. T.	Warren House, Wrington	1	1	0
Gifford, G.	Lyde Green, Pucklechurch, Bristol	1	1	0
Gill, F. C.	Westland Farm, Challacombe, Devon	1	0	0
Gillingham, J. & Son	Prospect House, Chard	1	0	0
Gisborne, Col. L., C.M.G.	Lingen Hall, Brampton Bryan	1	0	0
†Gladstone, J.	Bowden Park, Chippenham		..	
Glanely, Lord	The Court, St. Fagan's, Glam.	1	0	0
Glanville, F.	Poplar Farm, Westbury-sub-Mendip, Wells	1	0	0
Glencross, T.	The Paddocks, Stoke Gifford	1	1	0
Glover, J.	Cornwood, S. Devon	1	0	0
Glyn, Sir R. F., Bart.	The Cross House, Fontnell Magna, Shaftesbury	1	0	0
Godfrey, J. B.	Downside Farm, Shepton Mallet	1	0	0
†Godman, C. B.	Woldringfold, Horsham		..	
Godman, J.	The Raswells, Hascombe, Godalming	1	0	0
Godwin, Warren and Co., (Ltd.)	140, Redcliffe Street. Bristol	1	0	0
†Goldney, Sir Prior, Bart., C.B.	Derriads, Chippenham		..	
Goodchild, G. A.	The Oak House, Great Yeldham, Essex	1	1	0
Goodden, J. R. P.	Compton House, Sherborne	1	0	0
Goodman, A. & Sons	3, Hammett Street, Taunton, and Broad St. House, London, E.C.	1	0	0
*Gordon, Major R.G.S., M.C.	Langton House, Blandford	2	0	0
Gordon, G. H.	The Barn House, Sherborne	1	0	0
Goring, C.	Wiston Park, Steyning	1	0	0
†Gorringe, Hugh	Kingston-by-Sea, Brighton		..	
Graham Marquis of	Easton Park, Suffolk	1	0	0
Graham, Marchioness of	Easton Park, Suffolk	1	0	0
Grace A.	39, Welsh Back, Bristol	1	1	0
Graham-Clarke, Capt. J. E. H.	Frouston Manor, Stonehouse, Glos.	1	0	0
Grant-Ives, C. E.	Bradden House, Towcester, Northamptonshire	1	0	0
Grant, W. J.	Pentonville, Newport, Mon.	1	0	0
Gray, R.	The Estate Office, Sherborne	1	0	0
Greaves, R. M.	Wern, Portmadoc, North Wales	1	0	0
Green, A. W.	Stoke Abbey Farm, Stoke Bishop, Bristol	1	0	0
Green, E. A.	Cote Grange, Westbury-on-Trym, Bristol	1	0	0
†Green Major H. L.	Fernside, West Derby		..	

Name	Residence	Sub-scriptions		
		£	s.	d.
†Greenall, Mrs. C. E.	The Manor, Carlton Scroop, Grantham	..		
†Greenall, Sir G., Bart.	Walton Hall, Warrington	..		
Greenway, W.	Halse, Taunton	1	0	0
Greenwell, Sir B., Bart.	Marden Park, Woldingham, Surrey	1	0	0
Greenwood, J. C.	Claverton Down, Bath	1	0	0
Gregory, W.	Wellington, Somerset	1	1	0
Grey, E. T.	Cowley Farm, Kingweston, Bristol	1	0	0
Griffin, A.	Claverham House, Claverham, near Bristol	1	1	0
Griffin, L.	Manor Farm, Upton Cheyney, near Bristol	1	0	0
†Guest, Miss	Inwood, Templecombe	..		
†Guest, Lady Theodora	Inwood, Templecombe	..		
Guest, H. M.	Keynsham, Bristol	1	0	0
*Guildford, Earl of	Waldershare Park, Dover	2	0	0
Guille, H. C. de Stevens	Westleigh House, Westleigh, near Bideford, N. Devon	1	0	0
Guise, Sir W. F., Bart.	Elmore Court, Gloucester	1	0	0
Gullick, W. F., F.R.H.S.	Waterloo Nursery, Salisbury	1	0	0
Gunther, C. E.	Tongswood, Hawkhurst, Kent	1	0	0
Gwyn, H. M.	Woodlands, Stoke Bishop, Bristol	1	0	0
Gwyn, Mrs. D.	Woodlands, Stoke Bishop, Bristol	1	0	0
Habgood, G.	Harley Lodge, Wimborne	1	0	0
Hale, M. T.	Court Farm, Wookey, Wells	1	0	0
*Hambleden, Viscount	Greenlands, Henley-on-Thames	5	0	0
*Hambro, Sir E. A., K.C.V.O	Hayes Place, Kent	2	0	0
Hamilton, Capt. H. P.	Breinton, Hereford	1	0	0
Hancock, H. C.	The Court, Milverton, Taunton	1	0	0
Hancock, Mrs. R. D.	Halse, Taunton	1	0	0
Handcock, J. T.	West India House, Baldwin Street, Bristol	1	0	0
Hanks, W.	Aston Magna, Moreton-in-Marsh	1	0	0
Harbottle, E. H	Topsham Devon	1	0	0
Harding, A.	Sanigen, Berkeley, Glos.	1	0	0
Harding, E. G.	Foscote, Grittleton, Chippenham	1	0	0
Harditch, J. A,	Shipway Gate Farm, Portbury, Bristol	1	0	0
Hardwick, A.	Easton in Gordano, Bristol	1	0	0
Hardy, H. W.	Haycroft, Sherborne, Northleach	1	0	0
Hare, Lady K. F.	Brokenhurst Park, Hants	1	0	0
Harris (Calne), and the General Produce Co. (Ltd.)	55, Victoria Street, Bristol	1	0	0
Harris, H.	Singleton Park Farm, Sketty, S.O., Glam.	1	0	0
Harris, J.	Wistland Road, Kentisbury, North Devon	1	0	0

Name .	Residence	Sub-scriptions		
		£	s.	d.
Harris, J. M.	Chilvester Lodge, Calne, Wilts	1	0	0
Harrison, D.	The Grove, Tenby	1	0	0
Harrison, L. and Co.	Pedigree Stock Farms, Coolham, Horsham, Sussex	1	0	0
Harrison, McGregor & Co.	Leigh, Lancashire	1	0	0
Hart, W. H.	Home Farm, Biddestone, Chippenham	1	0	0
Hartley, Major H. B.	Tytherington, Heytesbury, Wilts	1	0	0
Haward, T. W..	Margam, Port Talbot, South Wales	1	1	0
Hawker, Capt. H. G..	Strode, Ermington, Ivybridge	1	0	0
Hawkins, A. W. Bailey	Stagenhoe Park, Welwyn, Herts	1	0	0
†Haydon, Lt.-Col. W. H.	Maidford, Malmesbury, Wilts		..	
Hayes-Sadler, Mrs. A. F.	44, Curzon Street, London, W.1	1	0	0
Hayes, F. J.	West Pennard, Glastonbury	1	0	0
Heathcoat-Amory, Sir I. M., Bart.	Hensleigh, Tiverton, Devon	1	0	0
*†Henderson, Lieut.-Col. Hon. H. G.	Buscot Park, Faringdon, Berks		..	
Heneage-Vivian, Rear Admiral Walter	Parc le Breos, Penmaen, Glam.	1	0	0
Henry, Lt.-Col. F.	Elmstree, Tetbury	1	0	0
Heppel, F. M.	Camerton, near Bath	1	1	0
Heseltine, Lt.-Col. J. E. N.	Etchinhampton House, Devizes	1	0	0
Hesse. F. W.	Weston Hill, Weston Park, Bath	1	0	0
†Hewitt, G. Southby	Day, Son & Hewitt, 22, Dorset Street, London, W.1.		..	
Hick, G. H.	Wayfield, Batheaston, Bath	1	0	0
Hick, W. A.	Wayfield, Batheaston, Bath	1	0	0
Hickman, A. J.	Halsey Grange, Brackley, Northants	1	0	0
Hicks, R. S.	Wilbrahams Farm, Great Wilbrahams, Cambs.	1	1	0
Hicks-Beach, Lady Susan	Coln S. Eldwyn, Fairford, Glos.	1	0	0
Hickton, J. W.	Bellbroughton, Stourbridge	1	0	0
Higgins, B.	Millhouse Farm, Evercreech	0	10	0
Hignett, G.	Hodshill, Southstoke, Bath	1	1	0
Hignett, Mrs. G.	Hodshill, Southstoke, Bath	1	1	0
†Hill, B. H.	Uphill, Weston-super-Mare		..	
Hill, H	Paulton, near Bristol	1	1	0
Hill, C. L.	Harptree Court, East Harptree, near Bristol	1	0	0
Hill, S.	Langford House, Churchill, Bristol	1	0	0
Hill, Major V. T.	Woodspring Priory, near Weston-super-Mare	1	1	0
†Hinckes, Captain R. T.	Mansel Court, Mansel Lacey, Hereford		..	
Hippisley & Sons	Wells, Somerset	1	0	0
Hippisley, R. J. B.	Ston Easton Park, Bath	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Hiscock, Victor	France Farm, Blandford	1	1	0
Hitch, W. H.	Manor Farm, Elkstone, Cheltenham	1	0	0
Hoare, E. S.	39, Broad Street, Bristol	1	1	0
†Hoare, Sir H. H. A., Bart.	Stourhead, Zeals, S.O., Wilts		..	
Hobhouse, A. L.	Brigdene, Waldron, Sussex	1	0	0
†Hobhouse, R. A.	Pondmead, Oakhill, Somerset		..	
*Hobhouse, Rt. Hon. H.	Hadspen House. Castle Cary	2	0	0
†Hoddinott, S.	Dean Vale, West Cranmore, Shepton Mallet		..	
Holford, Mrs. Gwynne	Buckland, Bwlch, Breconshire	1	0	0
Holland, J. H.	Peene House, Newington, Shorncliffe Camp, Kent	1	0	0
Holmes, J. V.	Frondeg, New Road, Llanelly	1	1	0
Holt Needham, O. N.	Barton Court, Colwall, nr. Malvern	1	0	0
†Holt Thomas G.	North Dean House, Hughendon, Bucks.		..	
Hooley, T. F.	Dry Drayton, Cambridge	1	0	0
Hooper, Bros.	Newburgh, Winfrith, Dorchester	1	0	0
†Horner, Sir J. F. Fortescue	Mells Park, Frome		..	
Horsington, C.	Fenny Castle, Wookey, Wells	1	0	0
Horton-Starkie, Rev. Preb. Le G. G.	Wellow Vicarage, Bath	1	1	0
Hosegood, A. W.	Williton, Taunton	1	0	0
Hosegood, Obed., jun.	Dillington, Ilminster	0	10	0
House, V. J.	Walcombe, Wells	1	0	0
Howard, A. H. S.	Thornbury Castle, Gloucester	1	0	0
Howard, J. & F.	Bedford	1	0	0
Howe, G.	Hunting Stables, Taunton	1	0	0
Huggett, O. W.	53, Corn Street, Bristol	1	1	0
†Hughes, A. E.	The Laurels, Bargates, Leominster		..	
Humphries. Sir. Sidney J.P.,	Eastfield Lodge, Westbury-on-Trym, Bristol	1	1	0
†Hurle, J. C.	Kilve Court, Bridgwater		..	
Hurle, Major J. A. Cooke	Yarlington House, Wincanton	1	0	0
Hurst & Son	152, Houndsditch, London, E.1.	1	0	0
*Hussey A. H.	Maincombe, Crewkerne	2	0	0
Hussey, T.	Manor Farm, Coxley, Wells	1	0	0
Hutton, K. M.	East Farm, Affpiddle, Dorchester	1	1	0
†Hylton, Lord	Charlton, near Radstock		..	
*Ilchester, Earl of	Melbury, Dorchester	2	2	0
Iles, D.	Lyegrove, Badminton	1	0	0
Imbert-Terry, Capt.	Blue Hayes, Broadclyst, Devon	1	0	0
Imbert-Terry, Mrs. L.	Blue Hayes, Broadclyst, Devon	1	0	0
Imperial Live Stock Insurance Co.	17, Pall Mall, East, London, S.W.	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
International Harvester Co. (Ltd.)	80, Finsbury Pavement, London, E.C.	1	0	0
Ireland, A. C.	Brislington Hill, near Bristol	1	1	0
Irvine, H. O.	Southerndown, Bridgend, Glam.	1	0	0
*Islington, Lord	Hartham Park, Corsham	2	0	0
*Ismay, J. H.	Iwerne Minster, Blandford, Dorset	2	0	0
Jackman, Percy	Pulteney Hotel, Bath	1	0	0
Jackson, Sir Henry Mather, Bart.	Llantillio Court, Abergavenny	1	0	0
James, Mark	Home Farm, Ston Easton, Bath	1	0	0
James, W. R.	Binegar, Bath	1	0	0
Jardine, John	The Park, Nottingham	1	1	0
Jarmain, T. M.	Haseley Iron Works, Tetsworth	1	1	0
Jenkins, D.	Flemingstone Court, Cowbridge, Glam.	1	0	0
Jenkins, E.	c/o F. Capern, Lewin's Mead, Bristol	1	0	0
Jenkins, T. E.	Kilvrough Home Farm, Park Mill, S.O., Glamorgan	1	0	0
Jenkins, Captain Vaughan	St. Winifreds, Combe Down, Bath	1	0	0
*Jersey, Earl of	Middleton Park, Bicester, Oxon	2	0	0
†Jervoise, Mrs. B. A. L.	Herriard Park, Basingstoke		..	
Jervoise, F. H. T.	Herriard Park, Basingstoke	1	1	0
Jeyes' Sanitary Compounds Company	Cannon Street, London, E.C.4.	1	0	0
John, T. D.	The Hollies, Lisvane, Glam.	1	0	0
John, W. H.	High Street, Cowbridge, Glam.	1	0	0
Johnstone, F. E.	Small Hythe, Tenderden, Kent	1	0	0
Johnstone, G. H.	Trewithen, Grampound Road, Cornwall	1	0	0
Joicey-Cecil, Col. The Lord John	Chute Lodge, Andover	1	0	0
Jones, A.	Bowcott Farm, Wotton-under-Edge, Glos.	0	10	0
Jones, E., J.P.	The Plas, Trimsaran, near Llanelly	1	0	0
Jones, F. G.	Church Farm, Mitcheltroy, near Monmouth	1	0	0
†Jones, H. G.	Downford, Mayfield, Sussex		..	
Jones, T. S.	Frondez, Radyr, Cardiff	1	0	0
Jones & Son	Tolbury Mills, Bruton	1	1	0
*Joyce, Rev. W. W.	Charles Parsonage, South Molton	2	0	0
Kay-Mouat, Miss K.	The Firs Farm, Malvern Wells	1	0	0
*Kearse, A.	Manor Farm, Latton, Cricklade, Wilts	2	2	0
Keeling, G.	North Hill Farm, Dunkerton, Bath	1	0	0
Keen, T. R. W.	Crannell Farm, Polsham, Wells	1	0	0

Name	Residence	Sub-scriptions £	s.	d.
Keen, R. L.	Furlong Farm, Westbury-sub-Mendip, Wells	1	0	0
Keen, R. T.	Furlong Farm, Westbury-sub-Mendip	1	0	0
Kekewich, Sir T. H., Bart.	Peamore, Exeter	1	0	0
Kell & Co.	Gloucester	1	0	0
Kelly, Col. A. L.	Cadbury House, Wincanton, Somerset	1	0	0
Kelway, W.	Huish Episcopi, Langport	1	1	0
†Kemp, L. J.	Maer, Exmouth		..	
Kennaway, Sir J., Bart.	Escot, Ottery St. Mary	1	0	0
Kennion, George Wyndham, Dr., D.D.	11, Alloway Place, Ayr, N.B.	1	1	0
Kenward, E.	Axford Lodge, near Basingstoke	1	0	0
*Keyser, C. E.	Aldermaston Court, Reading	2	0	0
Kidner, S., O.B.E.	Bickley, Milverton, near Taunton	1	0	0
Kidston, G.	Hazlebury, Box, Wilts	1	0	0
Killen, C. J.	Middle Farm, West Horrington, Wells	1	0	0
Killen, J. J.	Rood Farm, Butleigh, Glastonbury	1	0	0
Killen, R.	Manor Farm, Farrington Gurney, Bristol	1	0	0
King, Mrs. A. C.	Braishfield Pony Stud, Romsey, Hants	1	0	0
King, E. A.	Proudcross Farm, East Harptree, near Bristol	1	0	0
King, E. W.	Chew Magna, near Bristol	1	0	0
King, H. R.	Estate Office, Poles, Ware, Herts	1	1	0
King, T.	Lower Barnes, Wotton-under-Edge, Glos.	1	0	0
King & Sons, R.	Milsom Street, Bath	1	1	0
Knight-Bruce, R.	The Sanctuary, Shobrooke, Crediton	1	0	0
Knight, S. J.	Buckingham Lodge, Keynsham Bristol	1	0	0
Knight R. W. R	Compton Dando, near Bristol	1	0	0
†Knollys, C. R.	Weekley, Kettering		..	
Knox, E.	Richmond Grove, Bath	1	1	0
†Kruse, W.	St. Blazey, Par Station, Cornwall		..	
†Lake, C.	Glenthorne, Gravesend		..	
*Lansdowne, Marquis of	Bowood, Calne	2	0	0
Larkworthy, E. W.	Messrs J. L. Larkworthy & Co., Worcester	1	1	0
†Latham, T.	Dorchester, Oxon		..	
Lauder, J	Lydney Park, Gloucester	1	1	0
Laurie, A. Dyson	Stone Street Farm, Sevenoaks	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Lawes, Algernon (Ltd.)	203, Hornsey Road, London, N.7	1	1	0
Lawton, W.	Kindatt, Penn Lea Road, Bath	1	0	0
Lear, H. H.	Farms Office, Easton Park, Wickham Market, Suffolk	1	0	0
Leeder, E. H.	Mount Pleasant House, Swansea	1	0	0
Leitrim, Earl of	Court Lodge Farm, Teston, Maidstone	1	1	0
Lethbridge, Charles	Carlton Club, London, S.W.	1	0	0
Leverton, W. A.	Columb John Farm, Stoke Canon, Exeter	1	0	0
Lewis, Col. H	Green Meadow, near Cardiff.	1	1	0
Lewis, Wm. & Son (Ltd.)	*Herald* Office, Bath	1	0	0
Lewis, W.	Langstone Court, Newport, Mon.	1	0	0
†Ley, John Henry	Trehill, Exeter	..		
†Leyland, C. J.	Haggerston Castle, Beal, Northumberland	..		
Liddell, Capt. C. O.	Shire Newton Hall, Chepstow	1	1	0
Liddon, E., M.D.	Silver Street House, Taunton	1	0	0
Lipscomb, Godfrey	Margam Park, Port Talbot	1	0	0
Lister, R. A. & Co. (Ltd.)	Dursley, Glos.	1	1	0
†Lister, J. J.	Warninglid Grange, Haywards Heath	..		
Llewellyn, Capt. Llewellyn T. E.	Hackwood, Basingstoke	1	0	0
Llewellyn, Griffiths R. P.	Combend, Elkstone, Colesborne S.O.	1	0	0
*Llewelyn, Sir J. T. D., Bart.	Penllergaer, Swansea	2	2	0
Lloyd, Miss W. E.	Woodside Farm, Goring Heath, Oxon.	0	10	0
*†Long, Rt. Hon. Viscount	Rood Ashton, Trowbridge.	..		
Long, Col. William	Woodlands, Congresbury, Somerset	1	0	0
Long, W. F.	Broadway House, Chilcompton, Near Bath	1	0	0
Longrigg, G. E.	Weston Lea, Bath	1	0	0
Lopes, Sir H. Y. Buller, Bart.	Maristow, Roborough, Devon	1	0	0
Lord Wandsworth Agricultural College	Long Sutton, Winchfield, Hants	1	0	0
Loveless, J. D.	Melton Lodge, Neva Road, Weston-super-Mare	1	0	0
Loxton, A. H.	Croft Farm, Westbury-sub-Mendip, Wells	1	0	0
Loxton, J.	Hurn Farm, Wookey, Wells	1	0	0
Lucas, A. T. S.	Manor Farm, Cold Ashton, Marshfield, Chippenham	1	0	0
Luckes, S.	Bridge Street, Taunton	1	0	0
Ludlow, Lady	Luton Hoo, Luton	1	0	0
*Luff, J. Purnell	The Towers, Evercreech, Bath	2	2	0
†Lupton, N. D.	Chalmington, Cattistock, Dorset	..		
Luscombe, B.	Bowden, Yealampton, Devon	1	0	0
†Lutley, J. H.	Brockhampton, Worcester	..		

Name	Residence	Subscriptions		
		£	s.	d.
Luttrell, Major A. C.	Lea Combe House, Axminster	1	1	0
Luttrell, Capt. A. F.	Court House, East Quantoxhead, Bridgwater	1	0	0
Luttrell, Claude M F	Benmead, Box, Wilts	1	1	0
MacGregor, Brig.-Gen. W.	Claverton Rectory, Bath	1	0	0
Macdonald, H. L. S.	Avondale, Bathford, Bath	1	0	0
Macey, H.	Penn Park, Westbury-on-Trym, Bristol	1	0	0
Macleod, Mrs.	Woodford House, Chew Stoke, near Bristol	1	0	0
Major, H. J. and C. (Ltd.)	Bridgwater	1	0	0
Malet, Col. Sir Harry	Wilbury, Newton Tony, Salisbury	1	0	0
†Mansell, A. E.	Mount Vernon, Melton Mowbray, Tasmania		..	
Mansfield, T.	Winterbourne Court, Winterbourne, Bristol	1	0	0
Mapstone, R. G.	Glastonbury	1	0	0
Marcus, M.	High Trees, Redhill, Surrey		0	0
Mardon, Lt.-Col. A. C.	Oakhayes, Woodbury, South Devon		0	0
Marfell, R. H.	Great House Farm, Llangeview, Usk		0	0
Marshall, H. C., C.C.,	Wrington, Somerset		0	0
Marshall, J. I.	Park Farm, Bath		0	0
Marshall, L. H.	Chippenham		0	0
Marshall, Sons & Co. (Ltd.).	Britannia Iron Works, Gainsborough		0	0
Martin, Col.	Bishops Caundle, Sherborne		0	0
Martin, Mrs.	Bishops Caundle, Sherborne		0	0
Martin, J.	Thorverton, R.S.O., Devon		0	0
Martin, W.	Colleton, near Chulmleigh		0	0
Martyn, G.	Tremeddan, Liskeard, Cornwall		1	0
Mason, F. F.	Swansea		0	0
Massey-Harris Co. (Ltd.), (G. W. Dawkins, General Manager)	54 & 55, Bunhill Row, London, E.C.1	1	0	0
Masters, A.	Kyneton, Thornbury, Glos.	1	0	0
Mathews, Ernest	Little Shardeloes, Amersham, Bucks	1	0	0
Matthews, H.	Winterbourne, Bristol	1	0	0
Maunder, J.	Kingweston, Taunton	1	0	0
Maunder, L. T.	Butleigh, Glastonbury	1	0	0
May, E. Howard, c/o May and Hassell (Ltd.)	Baltic Wharf, Bristol	1	0	0
Meaker, W.	Charlton Mackrell, Taunton	1	0	0
Meddick, William G.	11, Great Stanhope Street, Bath	1	0	0
Membery, R.	37, Southgate Street, Bath	1	0	0

Name	Residence	Sub-scriptions		
		£	s.	d.
Merry, Richard	Goulds, Broadclyst, Exeter	0	10	0
Merson, T. H.	Farington, N. Petherton, Bridgwater	1	0	0
*Methuen, General Lord, C.B., C.M.G.	Corsham Court, Wilts	2	0	0
*Methuen, Hon. Paul	Beanacre Manor, Melksham	2	0	0
Mildmay, Capt. C. B. St J.	Hallam, Dulverton	1	0	0
*Mildmay, Lieut.-Col. The Right Hon. F.B., M.P.	Flete, Ivybridge, S. Devon	2	2	0
†Mildred, G. B.	. . . .		..	
†Miles, Lieut.-Col. Sir Charles W., Bart.	The Manor House, Walton-in Gordano, Clevedon		..	
Miles, H.	Auctioneer, Farrington Gurney, Bristol	1	0	0
Millard, A. A.	Pearash Farm, Penselwood, Bourton, Dorset	1	0	0
Millard, F. J.	Bridge Farm, Butleigh, Glastonbury	1	0	0
Millen, O. C.	Adisham Court, Canterbury, Kent	1	0	0
Miller-Hallett, A.	Goddington, Chelsfield, Kent	1	1	0
Mills, B. W.	31, Cambridge Place, Paddington, London, W.	1	0	0
Mitchell, Mrs. C. L	Highgrove, Tetbury	1	0	0
Mitchell, T. E.	Tan House, Bromyard, near Worcester	1	1	0
Mogg, B. D.	Cherry Orchard Farm, Wells	1	0	0
Molassine Co. (Ltd.)	East Greenwich, London, S.E.	1	0	0
Mond, Sir Alfred	Melchet Court, Romsey	1	0	0
Moody, C.	Maisemoor, Evercreech	1	0	0
Moody, G. W.	Stapleton, Martock, Somerset	1	0	0
Moore, G.	Paradise Farm, Coxley, Wells	1	0	0
†Moore, H. F.	Renée House, 48, Dulwich Road, Herne Hill, S.E.24		..	
Moore-Gwyn, J. E.	Duffryn, Neath, Glamorgan	1	0	0
†Moore-Stevens, J. R. C.	Woodhayes, Whimple, Devon		..	
Moore-Stevens, Col. R. A.	Woodhayes, Whimple, Devon	1	0	0
Morel, C. E.	. . . .	1	0	0
Morgan, Brg.-Gen. Sir Godfrey, K.C.B., C.B., C.M.G., D.S.O.	Camp Farm, Stroud	1	0	0
Morland, J. C.	The Orchard, Street, Somerset	1	0	0
*Morley, Earl of	Saltram, Plympton, Devon	2	0	0
*Morris, C.	Highfield Hall, St. Albans	2	0	0
Morris and Griffin (Ltd.)	Maindee, Newport, Mon.	1	1	0
Morris, Sir R. A., Bart.	Sketty Park, Swansea	1	0	0
Morris, Son and Peard	Auctioneers, North Curry, Taunton	1	0	0
Morrison-Bell, Col. E. F.	The Close, Tetbury, Glos.	1	0	0
*†Morrison, Hugh, M.P.	Fonthill House, Tisbury, Wilts		..	
Morrison, Major J. A., D.S.O	Berwick House, Hindon, Salisbury	1	0	0
†Morrison, J. A.	Basildon Park, Reading		..	

Name	Residence	Subscriptions		
		£	s.	d.
Mortimer, Capt. A. E.	Wall's Court, Stoke Gifford, near Bristol	1	0	0
Mortimer, G. W.	Wall's Court, Stoke Gifford, near Bristol	1	0	0
Mortimer, Major M. W.	Longleat Estate Office, Warminster	1	1	0
Mount-Edgcumbe, Earl of	Mount Edgcumbe, Devonport	1	1	0
*Munn, F. S.	Dumballs Road, Cardiff	2	0	0
Muntz, Mrs. J. O.	Foxhams, Horrabridge, S. Devon	1	0	0
Murch, J.	Charlton Mackrell	1	0	0
Murray-Anderdon, H. Edwd.	Henlade House, Taunton	1	1	0
Napier, H. B.	Ashton Court Estate Office, Long Ashton, Bristol	1	1	0
Neagle, D. T.	London, Gloucester and N. Hants Co. (Ld.), 25, Whatley Road, Clifton, Bristol	1	0	0
Neal, Mrs. G.	Kingsdon, Taunton	1	1	0
Neale, Hastings	Berkeley, Glos.	1	0	0
Neeld, Sir A. D., Bart., C.B.	Grittleton, Chippenham	1	0	0
Nelder, C. W.	Carnarvon Arms, Dulverton, Somerset	0	10	0
†Neville, Lieut.-Commander Ralph, R.N.	Butleigh, Glastonbury		..	
†Neville-Grenville, Robert	Butleigh Court, Glastonbury		..	
New, H. G.	Craddock, Cullompton, Devon	1	0	0
Newall, R. S.	Fisherton de la Mere, Wyle, Wilts	1	1	0
Newington, C.	Oakover, Ticehurst, Sussex	1	0	0
Newman, Sir R. H. S., Bart., D.L., M.P.	Mamhead Park, near Exeter	1	1	0
Nicholetts, E. C.	The Lons, Bitton, Gloucestershire	1	0	0
Nichols, G.	Demerara House, Colston Avenue, Bristol	1	0	0
Nicholson, R. F.	Woodcott, Whitchurch, Hants	1	0	0
Nix, J. A.	Tilgate, Crawley, Sussex	1	1	0
Nixon, W.	The Cottage, Offchurch, Leamington	1	0	0
*Normanton, Earl of	Somerley, Ringwood	2	0	0
Northey, G., J.P.	Cheney Court, Box, Wilts	1	0	0
*Northumberland, Duke of	Albury Park, Guildford	2	0	0
Noxon, W. C.	Agent-General, Ontario Government, 163, Strand, London, W.C.2.	1	0	0
Nurse, F. G.	Wick Farm, Coxley, Wells	1	0	0
Nutt, Mrs. H. J.	Hampton House, Hampton-in-Arden, Warwick	1	0	0
Oakes, Mrs. W.	Graslawn House, Exeter	1	1	0
†O'Hagan, Lord	Pyrgo Park, Havering Atte Bower, Romford, Essex		..	

Name	Residence	Subscriptions £	s.	d.
O'Halloran, Miss P.	Fairwood Lodge, Killay, Glam.	1	0	0
*†Oppenheimer, Sir B., Bart.	Sefton Park, Stoke Poges, Bucks		..	
Osmond and Son	Grimsby	1	0	0
Owen, Major W. L.	Luntley Court, Pembridge, near Leominster	1	0	0
Paddison, W. P.	Research Department, Royal Arsenal, Woolwich, London, S.E.18	1	0	0
Paget, L. C.	Middlethorpe Hall, Yorks	1	0	0
*Paget, Sir Richard, Bart.	74, Strand, London, S.W.1	2	0	0
Palmer, A.	Land Agent, Wells	1	0	0
Palmer Tyre (Ltd.)	119, 121 and 123, Shaftesbury Avenue, London, W.C.2	1	0	0
Palmer, Brigadier General, G. Ll., C.B., M.P.	Lackham, Lacock, Wilts	1	0	0
†Palmer, R.	Lodge Farm, Nazeing, Waltham Cross, Essex		.	
Palmer, W. H.	York Buildings, Bridgwater	1	0	0
Palmer, W. Howard	Heathlands, Wokingham, Berks	1	0	0
Palmer, Mrs. W. Howard	Heathlands, Wokingham, Berks	1	0	0
†Parker, Hon. Cecil T.	The Grove, Corsham, Wilts		..	
Parker, F. J.	Plymouth Street, Swansea	1	0	0
Parmiter, P. J & Sons	Tisbury, Wilts	1	0	0
Parry-Okeden, Lieut.-Col. U. E. P.	Turnworth, Blanford	1	0	0
†Parsons, J. D. Toogood	Grasmere, East Hoathley, Sussex		..	
†Parsons, R. M. P.	Misterton, Crewkerne		..	
Parsons, F. W.	Speckington, Ilchester	1	0	0
Parsons, J.	The Lons, Portishead	1	0	0
Pass, Captain A. D	Manor House, Wootton, Fitzpaine, Charmouth, Dorset	1	0	0
Patey, Rev. C. R.	Stowford House, Ivybridge	1	1	0
Pawlyn, J. H. W.	Messrs. Ransomes, Sims & Jefferies (Ltd.), Orwell Works, Ipswich	1	0	0
Peacock, W.	3, Buckingham Gate, London	1	1	0
Pearce, C. E.	Sea Mills Farm, near Bristol	1	0	0
Pearce, F. W.	Kingweston, near Bristol	1	0	0
Pearce, W.	The Rookery, Pilning, near Bristol	1	0	0
Pearce, S. & Co	46a, Market Street, Manchester	1	0	0
Pearce, E.	Parsonage Farm, Long Ashton, Bristol	1	0	0
Pearce, H. J.	Grange Farm, Portishead	1	0	0
Pearce, J.	Parsonage Farm, Long Ashton, Bristol	1	0	0
Pearce, T. H.	Parsonage Farm, Long Ashton, Bristol	1	0	0

Name	Residence	Subscriptions £	s.	d.
Pearson, Major the Hon. Harold	Cowdray Park, Midhurst, Sussex	1	0	0
Peel, Viscount	52, Grosvenor Street, London, W	1	1	0
Pember, G. H.		1	0	0
Penberthy, Professor J.	Dean Hall, Newnham, Glos.	1	0	0
*Pender, Major H. Denison D.S.O.	Strangeways, Marnhull, Dorset	2	0	0
Pendarves, W. Cole	Pendarves, Camborne, Cornwall	1	1	0
Pepper, W. F.	New Redlynch Farm, Bruton	1	0	0
Perkins, Col. E. K.	Shales, Bitterne, Hants	1	1	0
Petherick, R., jun.	Acland Barton, Landkey, Barnstaple	0	10	0
Petters (Ltd.)	Yeovil	1	0	0
Pettifer, T. & Co.	Eydon, Banbury	1	0	0
Peyton, E. P.	Woodcote Lodge, Kenilworth	1	0	0
Phillips, F.	Nantcoch, Newport, Mon.	1	1	0
Phillips, G.	The Gaer, Newport, Mon.	1	0	0
Phillips, L. R.		1	1	0
Phipps, C. B. H.	Chalcot, Westbury, Wilts	1	0	0
Phipps, Hornby, Capt.	Somerton, Somerset	1	0	0
Pierce, E. T.	West Wood Farm, Filton, Glos.	1	0	0
Piggott, Brothers & Co.	220, 222, 224, Bishopsgate Street, Without, London, E.C.	1	0	0
Pike, C. A.	Chilean Nitrate Committee, Friar's House, 39-41, New Broad Street, London, E.C.2	1	0	0
†Pinney, R. W. P.	Somerton, Somerset		..	
Pitt, W.	The Albynes, Bridgnorth	1	0	0
Playle, A.	Bassingbourne Royston, Herts	1	0	0
Plumptre, H. F.	Goodnestone, Dover	1	0	0
*Plymouth, Earl of	Hewell Grange, Bromsgrove	4	0	0
*Poltimore, Lord	Court Hall, North Molton, Devon	2	2	0
Ponting, R.	Dulcote, Wells	1	0	0
Pool, D. and F.	Down Barns Farm, West End, Northolt, Uxbridge		0	0
Poole, Mrs. A. R.	King's Hill, Dursley		0	0
Poore, Capt. J.	Estate Office, Badminton, Glos.		0	0
Pope, Alfred	Dorchester		0	0
Pope, A.	Henstill, Sanford, Crediton		0	0
Pope, John	Nowers, Wellington, Somerset		0	0.
Popham, H. L.	Hunstrete House, Pensford, Bristol		0	0
Portal, Maurice	Holywell, Swanmore, Hants	1	0	0
Porter, W. J. H.	Glendale Farm, Wedmore	1	0	0
†Portman, Hon. C. B.	Goldicote, Stratford-on-Avon		..	
Portman, Hon. Mrs. C. B.	Goldicote, Stratford-on-Avon	1	0	0
Portsmouth, Earl of	Barton House, Morchard Bishop, Devon	1	0	0
Powell, G. E.	5, Henley Grove, Westbury-on-Trym, Bristol.	1	0	0

Name	Residence	Subscriptions £	s.	d.
Powell, G. F. .	10, Beaufort West, Bath . .	1	0	0
Powell, Mrs. G. E. . .	5, Henley Grove, Westbury-on-Trym, Bristol . . .	1	0	0
Pratt, A. T. . . .	Morston House, Trimley, Ipswich	1	0	0
Preston-Jones, A. . .	Mickleover House, near Derby .	1	0	0
Preston-Jones, J. .	Rushbury, Winchcombe . .	1	0	0
Price, J. H. . .	Higher Hill Farm, Butleigh, Glastonbury	1	0	0
Price, Owen .	Nantyrharn, Cray, Brecon .	1	0	0
Prichard, H. L.	Penmaen, R.S.O., Glam. . .	1	0	0
Prideaux, W. R. . .	Fenswood Farm, Long Ashton, Bristol	1	0	0
Prince, E. M. . . .	Peckington. Bath . . .	1	1	0
Pritchard, D. F., J.P.	Crumlin Hall, Crumlin, Mon. .	1	1	0
Proctor, H. & T. (Ltd.)	Cathay, Bristol . . .	1	1	0
Proudfoot, W. .	Woodbourne House, Shepton Mallet	1	0	0
Pullen, James .	Lapdown Farm, Tormarton, Gloucester	1	0	0
Pullen, J. W. .	Compton Greenfield, Bristol	1	0	0
†Purgold, A. D.	Ebnall Lodge, Gobowen, Salop .	..		
Pursey, E. . . .	Bailey's Court, Stoke Gifford, near Bristol	1	0	0
Pursey, J. H. R. .	Belle Vue, Filton, near Bristol .	1	0	0
*Pyman, Sydney . .	Pigeon House, Ross-on-Wye .	2	2	0
Quantock Vale Cider Co. .	North Petherton, Bridgwater .	1	0	0
Quested, J. E. . . .	Cheriton, Kent	1	0	0
Quilter, Sir Cuthbert, Bart.	Bawdsay Manor, Woodbridge .	1	0	0
Radcliffe, Wyndham Ivor .	Druidstone, near Cardiff .	1	0	0
*†Radnor, Earl of . .	Longford Castle, Salisbury	..		
Rawlence, Ernest A. .	St. Andrew's, Salisbury . .	1	0	0
Rawlence, G. Norman .	Salisbury	1	0	0
†Rawlence, Capt. N., D.S.O.	Salisbury	..		
Rea, F. H. . . .	Kite's Nest Farm, near Wotton-under-Edge, Glos.	1	0	0
Reakes, O. O. . . .	Masters Farm, Emborough. Bath	1	0	0
Reeves, Robert and John, and Son . . .	Bratton Iron Works, Westbury, Wilts	1	0	0
Rennie, J. H. . . .	Tregarn, Langstone, Newport, Mon.	1	0	0
Reynolds, Sylvanus . .	Corndean Hall, Winchcombe, Glos.	1	0	0
Reynolds, W. G. . .	The Crest, Keynsham, Bristol .	1	1	0

Name	Residence	Subscriptions		
		£	s.	d
Richardson Capt A	Seven Springs, Cheltenham	1	1	0
Richardson, Rev A	Bath and County Club, Bath	1	0	0
Ridge, Capt R T	The Manor Farm, Brockley, West Town, near Bristol	1	0	0
Riley, J L & A	The Iwaine, near Ledbury	1	0	0
Roberts, C M	16, Alfred Street, Bath	1	0	0
Robins, J and O	High Bray, South Molton	1	0	0
Robinson, E S & A (Ltd)	Redcliffe Street, Bristol	1	1	0
Robinson, John & Co	Bristol	1	1	0
Roe, W J	West Pennard, Glastonbury	1	0	0
Rogerson, R W (Ward & Co Seedsmen)	Northgate Street, Bath	1	0	0
Rolleston, S V	Saltford House, Saltford, Bristol	1	0	0
Roundway, Lord	Roundway Park, Devizes	1	0	0
Rouse Boughton, Sir W St A, Bart	Downton Hall, Ludlow	1	0	0
Rouse Boughton, Lady	Downton Hall Ludlow	1	0	0
Rowcliffe, E L	Stovolds Hill, Cranleigh, Guildford	1	1	0
Rowcliffe, E H L	Stovolds Hill, Cranleigh, Surrey	1	0	0
Rowcliffe H S	Kew Lodge, Kew Road, Weston super Mare	1	0	0
Rowett J Q	Ely Place Estate Office, Frant, Sussex	1	0	0
Rowlands, Dr M J	Nash Farm Keston, Kent	1	0	0
Rowland, P S	The Laurels, Llangenneth, Reynoldston, S O, Glam.	1	0	0
Royal Guernsey Agricultural and Horticultural Society	Guernsey	1	0	0
Rubeck, O P	"Valencia," Meath Green, Horley Surrey	1	0	0
Rudd Mrs	Felbridge Park Farm, East Grinstead, Sussex	1	0	0
Russell, G	North Hill Farm, Dundry, near Bristol	1	0	0
Russell Smith, A	North Houghton Manor, Stockbridge, Hants	1	0	0
Ruston & Hornsby (Ltd)	Grantham	1	0	0
Rutherford J A	Highclere Estate Office, Newbury, Berks	1	0	0
†St Audries, Lord	St Audries Bridgwater			
*St Germans, Earl of	St Germans, Cornwall	2	0	0
†Salmon, H C	North Field, Bridgwater			
Salmon, J	2, Sidmouth Street, Devizes, Wilts	1	0	0
Salter, Benjamin	Newlands, Broadclyst, Exeter	1	0	0
Salter, T	Beare Farm, Broadclyst, Exeter	1	0	0

Name	Residence	Subscriptions		
		£	s	d.
Samels, J. W.	Perfect Dairy Machines (Ltd.), 105, Middle Abbey Street, Dublin	1	0	0
Samuelson, Ernest	Bodicote Grange, Banbury	1	1	0
Sanders, Lt.-Col. Sir R.A., Bart., M.P.	Bayford Lodge, Wincanton	1	0	0
Sanford, Col. E. C. A., C.M.G.	68, St. James Court, Buckingham Gate, London, S.W.1	1	0	0
Sanford, H. S. J. A.	The Court House, Middlehill, Broadway, Worcestershire	1	0	0
Sankey, R. I.	South Hill, Hastingleigh, Ashford, Kent	1	0	0
Sawtell, G. H.	Kingweston, Taunton	1	0	0
Say, A. S..	Middle Farm, Croscombe	1	0	0
Scott, L. I.	Somerleaze, Wells	1	0	0
†Scott, T.			..	
Scutt, F. G.	218, Cheltenham Road, Bristol	1	1	0
†Seaton, Lord	Beechwood, Plympton, Devon		..	
Senior and Godwin	Auctioneers, Sturminster Newton, Dorset	1	1	0
Shaw, Col. F. S. Kennedy, C B E	Teffont Magna, Salisbury	1	1	0
†Shaw-Stewart, Walter R.	Hayes, Shaftesbury		..	
Sheldon, R. F.	West Street House, Wells	1	0	0
Shellabear, G. G.	Mount Tavy, Tavistock	1	1	0
*Shelley, Sir John, Bart.	Shobrooke Park, Crediton	2	2	0
*Shelley, J. F.	Posbury House, near Crediton	2	2	0
Shelley, Mrs. J F.	Posbury House, Crediton	1	0	0
Sheppard, P. C. O.	Dunraven Estate Office, Bridgend, Glam.	1	1	0
†Sherston, C. J. T.	Harewood, Leeds		..	
*Sidmouth, Viscount	Upottery Manor, Honiton	2	0	0
Silcock, R. & Sons	Stanley Hall, Union Street, Liverpool	1	0	0
Silcox, H. T.	White Hart Hotel, Wells	1	0	0
Sillifant, A. O.	Culm Leigh, Stoke Canon, Exeter	1	0	0
*Silvey, F. H.	Railway Station, Fishponds, Bristol	2	2	0
*Simpson, Charles (Hewthorn & Co.)	7, Lambs Passage, Chiswell Street, London, E.C 1	2	0	0
Simpson, F. C.	Maypool, Churston Ferrers, R.S.O., S. Devon	1	0	0
*Singer, W. M. G.	42, Charles Street, Berkeley Square, London, W.1	2	0	0
Skinner, G. C.	Pound, Bishops Lydeard	1	0	0
Skinner, Board & Co.	Exmoor Street, Bristol	1	0	0
Skinner, G. C.	Westbury-on-Trym, Bristol	1	0	0
Skinner, W. J.	The Laurels, Weare, Somerset	1	0	0
Slade, L. W.	Sheffield Lodge, Westbury-on-Trym, Bristol	1	0	0

Name	Residence	Sub-scriptions		
		£	s.	d.
Smart, G. E.	Combe Hay Manor, Bath	1	1	0
Smith, A. Carlyle	Sutton Hull, Woodbridge, Suffolk	1	0	0
Smith, D.	Court Farm, Stoke Gifford, near Bristol	1	0	0
Smith, A. J. (Ltd.)	9, Queen's Road, Bristol	1	0	0
Smith, J.	Monkton, Hereford	1	0	0
†Smith, J. W.	Thinghill Court, Hereford	..		
†Smith, S. Lee	Larkfield, Maidstone	..		
Smyth, Hon. G. N.	Ashton Court, Bristol	1	0	0
Smyth, Hon. Mrs.	Ashton Court, Bristol	1	0	0
Smyth-Richards, G. C.	Filleigh Lodge, South Molton	1	0	0
Soames, Captain A. Granville	Ashwell Manor, Penn, Bucks	1	0	0
*Somerset, Duke of	Maiden Bradley, Bath	2	0	0
Somerset Trading Co. (Ltd.)	Bridgwater	1	1	0
†Somerville, A. F.	Dinder House. Wells, Somerset	..		
Southwood, J. W.	1, St. Peter's Terrace, Twerton, Bath	1	0	0
Sparks, H. Weston	Oakcliff, Dawlish	1	1	0
Spear Brothers and Clark (Ltd.)	Southgate Street, Bath	1	0	0
†Spearman, Sir J. L. E., Bart.		..		
Speed, Capt. D. C. L.	Knowlton Court, near Canterbury	1	1	0
Speed, G.	Grove Farm, Chewton Mendip, Bath	1	0	0
Spencely, Hugh le Dispenser	Ashley House, Box, Wilts	1	0	0
Spencer, H. G.	Southill House, West Cranmor, Somerset	1	0	0
Spencer, W. C.	Bushley Park Farm, Tewkesbury	1	0	0
Spicer, Capt.	Spye Park, Chippenham	1	0	0
Spicer, Lady M.	Spye Park, Chippenham	1	0	0
Spiller, T. R.	Luccombe, Milton Abbas, Blandford	1	0	0
Spillers and Bakers (Ltd.),	Cardiff	1	1	0
Spratts' Patent (Ltd.)	24 and 25, Fenchurch Street, City, London, E.C.3	1	0	0
Spurrier, H.	Stype Grange, Hungerford, Berks	1	0	0
Stallard, A. E.	Burgate, Fordingbridge, Hants.	1	0	0
Stallard, H.	Burgate, Fordingbridge, Hants.	1	0	0
*†Stanley, E. A. V.		..		
*Stephens, G.	Down Manor, Wyle, Wilts	2	2	0
Stephens, T. A.	Hookstile House, South Godstone, Surrey	1	0	0
†Stern, Sir Edward, D. L.	Fan Court, Chertsey	..		
Stevens, R. N.	Woodham Hall, Woking, Surrey.	1	0	0
Stevenson, J. K. H.	The Chase, Upper Welland, Malvern Wells	1	0	0
Stewart, Rev. H. J.	The Vicarage, Cockett, Glamorgan	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Stilgoe, H. W.	The Grounds, Adderbury, near Banbury, Oxon	1	0	0
Stirling, Mrs.	Trym Bank, Combe Dingle near Bristol	1	0	0
Stirling, B. W.	Trym Bank, Combe Dingle, near Bristol	1	0	0
Stoddart, F.	The Denny, Portishead, Somerset	1	1	0
Stoffell, W. M.	Fairfield, Newbridge Hill, Bath	1	1	0
Stonehouse Works Co.	Spon Lane Mills, Houghton Street, West Bromwich	1	0	0
Storey, H. L.	The Manor House, Malmesbury	1	0	0
Storrar, J. I.	Tredegar Estate Office, Newport, Mon.	1	0	0
Stothert, Sir P. K., K.B.E.	1, Lansdown Place, West, Bath	1	0	0
Stott, A. M.	Hurn Farm, Wookey, Wells	1	0	0
Stott, F. J.	Wellesley Arms, Wells	1	0	0
†Strachie, Lord	Sutton Court, Pensford, Somerset		..	
Strafford, Earl of	Dancers Hill, Barnet	1	0	0
Strangways, Miss S.	Shapwick, Bridgwater	1	0	0
Stratton, Richard	The Duffryn, Newport, Mon.	1	0	0
Strawson, G. F., Junr	St. Andrew's Works, Horley Surrey	1	0	0
Stride, T.	Stanley House, Camden Road, Bath	1	0	0
Strode, G. S. S.	Newnham Park, Plympton	1	0	0
Stucley, H. V. G.	Pillhead, Bideford, North Devon	1	0	0
Studdy, T. E.	Broxton, Paignton	1	0	0
Studley, J. Im.	Toller Fratrum, Maiden Newton	1	0	0
Sutherland, R. W. J.	Gadairwen, Croesfaen, Glam.	1	0	0
*Sutton, E. P. F.	Sidmouth Grange, near Reading	2	2	0
*Sutton and Sons	Seedsmen, Reading	2	2	0
Swansea, Lady	Singleton, Swansea	1	1	0
Swanton, J. R. P.	Woodford, Wells	1	0	0
Swanwick, Bruce	The Road House, Rodborough Common, Stroud	1	0	0
Symons, J. & Co. (Ltd.)	The Plains, Totnes	1	1	0
Tagart, Major-Gen. Sir H., K.C.M.G., C.B., D.S.O.	Northcote Manor, Chulmleigh, N. Devon	1	1	0
Talbot, G. R.	Baltonsborough, Glastonbury	1	0	0
Talbot Miss (Exors. of the late)	Margam Park, Port Talbot	1	0	0
Tangyes (Ltd.)	Cornwall Works, Birmingham	1	0	0
Tanner, R. A.	Auctioneer, Glastonbury	1	0	0
Tanner, R.	New House, Kingston Bagpuise, near Abingdon, Berks	1	1	0
Tapp, David James	Knaplock, Winsford, Dulverton	1	0	0
Tasker W. & Sons (Ltd.)	Waterloo Ironworks, Andover	1	1	0

Name	Residence	Subscriptions		
		£	s.	d.
Tate, J. A.	Fairfield, Wells, Somerset	1	0	0
Taverner, G. E.	Budlake, Devon	1	0	0
Taylor, A. H. W.	8, New Bond Street, Bath	1	1	0
Taylor, E.	Red House, Bath	1	1	0
Taylor, E. J.	Penarth Lodge, Julian Road, Sneyd Park, Bristol	1	0	0
†Taylor, George	Cranford, Hounslow, W.		..	
Taylor, H. W.	The Castle, Yarkhill, Hereford	1	0	0
Taylor L. Acland	City Librarian, Central Library, Bristol	1	0	0
†Tazewell, W. H.	Manor House, Taunton		..	
*Temple, Earl	Newton St. Loe, Bristol	2	2	0
Templeman, G. D.	Hambridge, Curry Rivell, Taunton	1	0	0
Terry, G. A.	Wessex Villa, Odiham, Hants	1	0	0
Thomas, Capt. L. B.	Great Brampton, Madley, Hereford	1	1	0
Thomas, Sir Griffith	Court Herbert, Neath	1	0	0
Thomas, I.	Ely Farm, Cardiff	1	0	0
*Thomas, J.	Velindre, Kidwelly, Carmarthenshire	2	0	0
Thomas, J. H.	Cudleigh Court, Spetchley, Worcester	1	0	0
Thomas-Stanford, C. M.P.,	Preston Manor, Brighton	1	0	0
Thomas & Evans & John Dyer (Ltd.)	Swansea	1	0	0
*Thompson, Major J. C.	Swynnerton Estate Office, Stone, Staffs	2	2	0
Thompson, F. W. E., Wolseley Sheep Shearing Machine Co.	Alma Street, Birmingham	1	1	0
Thompson, V. T.	Norton Manor, Sutton Scotney, Hants	1	0	0
Thorne, J. G.	Horridge, Romansleigh, S Molton	0	10	0
Thornton, W. A.	Lock, Partridge Green, Sussex		1	0
Thresher, E. B.	Corfe Hill, Weymouth		0	0
Thring, Sir Arthur T.	Charlton House, Charlton Mackrell		0	0
Thurlow, G. R.	Stowmarket		0	0
Thynne, Lt.-Col. U. O.	Muntham Court, Worthing		0	0
Tidswell, R. J.	Haresfield Court, Stonehouse, Glos.		0	0
Till, J. B.	Mangotsfield, near Bristol		0	0
Tillard, Rear-Admiral P. F.	Alford House, Castle Cary		0	0
Tilley, T. H.	Manor Farm, Biddisham, Axbridge	1	0	0
Tinsley, C. H.	Twyford, Pembridge, R.S.O., Herefordshire	1	0	0
Tipper, B. C. and Son	Balsall Heath, Birmingham	1	0	0
Titt, J. W.	Implement Works, Warminster	1	0	0
Tolley, W. H.	Pitt Farm, Culmstock, Devon	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Toogood, E. K.	Messrs. Toogood & Sons, Southampton	1	0	0
Tory, R.	Charisworth, Blandford	1	0	0
Tory, R. N.	Anderson, Blandford, Dorset	1	0	0
Trafford, G. R.	Hill Court, Ross, Herefordshire	1	1	0
*Tredegar, Lord	Tredegar Park, Newport, Mon.	2	2	0
Treffry, I de C.	Penarwyn, Par Station	1	1	0
Treffry, Mrs. I. de C.	Penarwyn, Par Station, Cornwall	1	0	0
Tregonning, Capt. C. N	Bryn Hafod, Llanelly	1	0	0
†Tremaine, W. H.	Sherborne, Northleach, Glos.		..	
Tremayne, Col. W. F	Carclews, Perran ar Worthal, Truro	1	1	0
Treowen, Lord	Llanarth Court, Raglan, Mon.	1	0	0
Trevilian, Major M.	Curry Rivel, Taunton	1	0	0
Trotman, A. W.	Langston Court, near Newport, Mon.	1	0	0
Trotter Miss	Chatley, Norton St. Philip, Bath	1	0	0
Troup, Lieut.-Col. Alan G., D.S.O.	Knighton, Broadchalke, Salisbury	1	0	0
Trump, W.	Borough Farm, Broadclyst, Exeter	1	0	0
Tucker, M. & Sons	Broad Quay, Bath	1	0	0
†Tudway, C. C.	The Cedars, Wells, Somerset		..	
Tudway, Lieut. L. C.P., D.S.O.	Milton Lodge, Wells	1	0	0
Turnor, Lt.-Col. W. W	Pinkney Park, Chippenham	1	0	0
Tyley, W. J.	Manor Farm, Rodney Stoke, Wells	1	0	0
Uncles, B.	21, Trowbridge Road, Bradford-on-Avon	1	0	0
Unite, John (Ltd.)	291, Edgware Road, London, W.2	1	1	0
Utley, T., Jun.	Lyndhurst, Knoclaid Road, Liverpool	1	0	0
†Vacher, E. P.	Cowfold Lodge, Cowfold, Sussex		..	
Vaughan, C. de C.	Brockley, West Town, Somerset	1	0	0
Vaughan, Rev. Preb.	The Rectory, Wraxall, Somerset	1	0	0
Veitch, Peter C. M.	Exeter	1	0	0
Venning, H. B.	Willett, Bicknoller, Taunton	1	0	0
†Verulam, Earl of	Gorhambury, St. Albans		..	
Vine & Co. (Ltd.)	Cornhill Chambers, Swansea	1	1	0
Vinning, The Rev. H. S	The Vicarage, Hope-under-Dinmore, Herefordshire	1	0	0
Vivian, Miss D. E.	Clyne, Blackpyl, S. Wales	1	1	0
Vowles, S. C.	West India House, Baldwin Street, Bristol	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Waddell, J., J.P.	Ravelston, Tumble, near Llanelly	1	0	0
Waide, W. and Sons	Churn Works, Leeds	1	0	0
Wainwright, C. Donald	Summerleaze, Shepton Mallet	1	1	0
Waldegrave, Earl	Chewton Priory, Somerset	1	0	0
*Walker, Capt. P. L. E.	Great House, Chipping Sodbury, Glos.	2	0	0
Walker, E. G. F.	The Hollies, Chew Stoke, Bristol	0	10	0
Walker, H.	Cook's Folly, Bristol	1	0	0
†Walker, J.	Knightwick Manor, Worcester		..	
Walker, K. Murray	The Wilderness, Woodbridge, Suffolk	1	0	0
Wallace, W. & R.	Knebworth, Herts	1	0	0
Wallis and Steevens	North Hants Iron Works, Basingstoke	1	0	0
Walrond, Hon. Mrs. C. M. L.	Bradfield, Cullompton	1	1	0
†Walsingham, Lord	Merton Hall, Thetford, Norfolk		..	
Ward, J. E.	Red Lodge, Purton, Wilts	1	0	0
Ward, R. B.	Godinton, Ashford, Kent	1	0	0
Ward, Mrs. L. Bruce	Godinton, Ashford, Kent	1	0	0
Wardlaw, H. and A.	Holway Farm, Sherborne	1	0	0
†Waring, C. E.	Conservative Club, Cardiff		..	
†Warner, Col. Sir Courtenay, Bart, C.B., M.P.	Bretterham Park, Suffolk		..	
Warren, W. C.	Farthing's Farm, Coneytrowe, Taunton	1	0	0
Warren, W. J.	Deacons Farm, Staplegrove, Taunton	1	0	0
Warren, & Sons	Corn Merchants, Taunton	1	0	0
Warry, Col. B.	Shapwick, Bridgwater	1	0	0
Waterloo Mills Cake and Warehousing Co. (Ltd.)	Wilmington, Hull	1	0	0
Watson, H. R	Milborne Wick, Milborne Port	1	0	0
Watson, Sir T. E., Bart.	St. Mary's Lodge, Newport, Mon.	1	0	0
Watson, Capt. Hon. T. H.	Cormiston, Milverton, Somerset	1	0	0
†Watts, Major E. M.	Eastwood Park, Falfield, Glos.		..	
Watts, Mrs. E.	Eastwood Park, Falfield, Glos.	1	0	0
Watts, J.	Backwell, near Bristol	1	0	0
Way, G. D.	45, Manor Park, Redland, Bristol	1	0	0
Way, J. H.	45, Manor Park, Redland, Bristol	1	0	0
*Way, General N. S.	Manor House, Henbury, Bristol	2	0	0
Weaver & Co.	Beaufort Warehouses, Swansea	1	0	0
Webb, E. and Sons	Wordsley, Stourbridge	1	0	0
Webb, Lieut.-Col. Sir H. M.P.	Llwynarthen, Cardiff	1	0	0
Webb, Major W. Harcourt	Hill House, Kinver, Stourbridge	1	0	0
Webb, T. J.	Hardwicke Farm, Gloucester	0	10	0
Weech, J. & Sons	Maudlin Street, Bristol	1	1	0
Weeks, E.	Wraxall, Shepton Mallet	1	0	0
Welch-Thornton, H.	Beaurepaire, Basingstoke	1	1	0
Wessex Associated News (Ltd.)	Westgate Street, Bath	1	0	0

Name	Residence	Subscriptions £	s.	d.
West, E. P.	Secretary-Manager, University of Bristol Research Station, Long Ashton, Bristol	1	0	0
Western Australia, Agent General for	Savoy House, Strand, London, W.C.2	1	1	0
Westminster, Duke of	Eaton Hall, Chester	1	1	0
Weston, H. and Sons	The Bounds, Much Marcle, *via* Dymock, Herefordshire	1	0	0
Whatley, Charles W.	Burderop, Swindon	1	0	0
Wherry, E.	Bourne, Lincolnshire	1	0	0
Whitaker, O. H.	Savoy House, Strand, London, W.C.2	1	1	0
†White, A. R., O.B.E.	Charnage, Mere, Wilts		..	
White, F.	Torweston, Williton	1	0	0
White, J.	Foxhill, Wanborough, Wilts	1	0	0
White, J. H.	Bagborough Farm, Shepton Mallet	1	1	0
*†White, Sir G. Stanley, Bart	Hollywood Towers, near Bristol		..	
White, W.	Pigeon House Farm, Bishopsworth, Bristol	1	1	0
White, W. J. S.	Zeals Park, Wiltshire	1	0	0
White, W. & Son	Pool Farm, Taunton	1	0	0
Whitehead, A.	Lydford Park Farm, West Lydford	1	0	0
Whitehead, J.	Lower Hill Farm, Butleigh, Glastonbury	1	0	0
Whitley, S. R.	Rookwood, Shinfield, Reading	1	0	0
Whitley, W. and H.	Primley Farm, Paignton	1	0	0
Whitting, C. E.	Uphill Grange, Weston-super-Mare	1	1	0
Whyatt, A. L.	Bishopsworth, Bristol	1	0	0
Wickham, C. E.	Palace Farm, Wells	1	0	0
Wigan, E. A.	Conholt Park, Andover	1	1	0
Wilder, J.	Yield Hall Foundry, Reading	1	1	0
Willcox, W. H. & Co.	36, Southwark Street, London, S.E.1	1	0	0
Williams, C., M.P.	Greenway, Churston Ferrers, South Devon	1	0	0
Williams, D. D.	Live Stock Commissioner, Tregaron	1	0	0
Williams, G. L.	Chavenage, Tetbury	1	1	0
Williams, Major Jestyn	Miskin Manor, Pontyclun	1	0	0
Williams, J.	Scorrier House, Scorrier, Cornwall	1	0	0
Williams, J. C., M.P.	Werrington Park, Launceston	1	0	0
†Williams, M. Scott	Woolland House, Blandford		..	
Williams, O.	Crossways, near Cowbridge, Glam.	1	0	0
Williams, P. D.	Lanarth, St. Keverne	1	1	0
†Williams, Col. Sir Robert, M.P.	Bridehead, Dorchester		..	
*†Williams, P. F. C.	Glen Side, Leigh Woods, Bristol		..	

Name	Residence	Subscriptions		
		£	s.	d.
Willis, J. Deane	Bapton Manor, Codford, Wilts	1	1	0
Wills, A. Stanley	21, Royal Crescent, Bath	1	0	0
*Wills, Capt. A. S.	Thornby Hall, Thornby, Northampton	2	0	0
Wills, Sir Frank	Bristol	1	0	0
Wills, G. A.	Burwalls, Leigh Woods, Bristol	1	0	0
*Wills, W. D. & H. O.	Bedminster, Bristol	2	0	0
Wills, W.	Marlwood, Thornbury, Glos.	1	0	0
Willson, Stephen	Canadian Pig Powder Factory, Peterborough	1	0	0
Wilmot, G.	11, Graham Road, Weston-super-Mare	1	0	0
Wilmot, R. M.	Brooklyn, Sidcup, Kent	1	0	0
Wilson, Dr. T. C.	Hull Manor Shire Stud Farm, Hinton Parva, Swindon	1	0	0
Wilts & Somerset Farmers (Ltd.)	Chippenham	1	1	0
Winstone, S. W.	Tickenham Court, Nailsea, near Bristol	1	0	0
Winter, Major F. J.	Canok Lodge, Walton-by-Clevedon, Somerset	1	0	0
†Winterton, Earl, M.P.	4, Wilton Street, Grosvener Place London, S.W.	..		
Wise, A. G.	Hampton House, Brislington, Bristol	1	1	0
Withers, C.	Glen Mere, Clapton, Portishead	1	0	0
Withers, J. T.	Faber Farm, Hambrook, near Bristol	1	0	0
Withers, L. H.	Manor Farm, Kimbridge, Rom-			
Withers, R.	Caswell Farm, Clapton, Portishead	1	0	0
Withers, R. B.	The Bungalow, Ham Green, near Bristol	1	0	0
	sey, Hants	1	0	0
Withers, W. R.	Lower Court Farm, Long Ashton, Bristol	1	0	0
Woodcock, Major J., D.S.O.	Ashley, Stockbridge, Hants	1	0	0
Woodhouse, Lt.-Col. S. H.	Heatherton, Taunton.	1	0	0
Wootton, J. H.	Byford, Hereford	1	0	0
Wright, J. R.	Ades, Chailey, Sussex	1	1	0
Wring, E. J.	338, St. John's Lane, Bedminster, Bristol	1	0	0
Wyatt, J.	Mizzymead Farm, Nailsea, Bristol	1	0	0
Wyatt, W.	Kingweston, Taunton	1	0	0
Wyld, Col. C. E.	Tile House, Denham, Bucks	1	0	0
†Wynford, Lt.-Col. Lord, D.S.O.	Wynford House, Maiden Newton, Dorchester	..		

Name	Residence	Subscriptions £	s.	d.
Yeo Bros., Paull & Co. (Ltd.)	81, Victoria Street, Bristol	1	1	0
Young, E. A.	Mangotsfield, Bristol	1	0	0
Young, E. E.	Cottage Farm, Claverham, near Bristol	1	0	0
Young, V. C.	The Green, Alveston, Glos.	1	0	0
Zacharias, J. & Co.	Oxford	1	0	0

(5)

Total . . 1246

INDEX.

Acidity of Bracken Soil, 85
Aeration, Effect on Root Development, 257
Agglutination Tests for Abortion, 15
Agriculture Act, 1920, 73
——, Board of, Report on Epizootic Abortion, 9
Agricultural Education, 75
Allotments, Awards, cii
Allotment Competition, 1921, 136
Analysis of Soils, Demonstration plots, 87
Analyses, Cider, 128
——, Demonstration Plots, 87
——, Selecting Samples for, cxxxii
——, Members' Privileges, cxxx
Annual Report on the Society's Operations, 138
Anti-Abortion Treatment, 18, 19
Aphis on Strawberries, 70
Apical Browning, 146
Apples, The Chemistry of, 189
——, Crossing stocks of, 171
——, Grafts from old trees, 49
Arsenate-of-Lead on Strawberries, 62, 69
Association of Mites and Reversion in Black Currants, 237
Attendance at Bristol Exhibition, 104
Awards, Bristol Show, iii

Banana, 48
Bang, Dr., on Epizootic Abortion, 8
Barker, Prof. B. T. P., on Cider Exhibit, 126
—— ——, on National Fruit and Cider Institute, 143
—— ——, Root Development, 257
Basic Slag on Grass, 78
Banyan tree, 47
Benedict, Harris M., on the Wild Grape, 50
Black Currant, Reversion of, 180
—— ——, Reversion of, Preventive Methods, 181
—— ——, Mite, 237
Bracken Eradication, 82, 92
Bramley Seedlings, 147
Bristol Exhibition, Cider Exhibit, 126
—— ——, Dairy Department, 105
—— ——, Entries in, 99 *et seq.*
—— ——, F. H. Storr on 99
—— ——, Forestry Section, 117
—— ——, Milk Test, 107, *et seq.*
—— ——, Nature Study Section, 121
Bristol Field Club, 124
Brown Rot, 146

Cabbage as Soiling Crop, 41
Calcium Arsenate on Strawberries, 69
——, Effect of on Leaf Scorch, 161
—— ——, on Growth, 165
Canadian Pond Weed, 48
Canker Control, 269
Carbolic Acid as cure for Abortion, 20
Chafer Grub, Habits, 59
—— ——, Means of destruction, 59
Chemical Analysis, cxxx
Chlorosis in Tomatoes, 150
Cider Exhibit at Bristol, 126
—— Making Trials, 1921, 252
Cock Chafer, 58
Click Beetle, 60
Committees, Standing, 1921-1922, cxxiv
Conditions and Regulations, Show, clx
Consulting Chemist, Annual Report, 275
Council, Members of, 1922, cxxiii
Cox's Orange Pippin, 152
Cundall, H. M., on Nature Study Section, 121
Currants, Crossing of Stocks, 172
Cutworms, 65

Dairy Department at Bristol, 105
—— Herd Competition, 129
Darbishire, O. V. on Botanical Analysis, 89
Davey, Sir Humphrey, on Soiling, 80
Demonstration Plots, 82 *et seq.*
Diseases (Animals) Act, 21, 141
Dun Oats for Soiling, 39

Education and Agriculture, 75
English Forestry Association, 119, 120
Epizootic Abortion of Bovines 1
—— ——, Cause of, 5, 7, 9
—— ——, Bull as carrier, 12
—— ——, Methods of Infection, 11, 13
—— ——, in Oxfordshire, 3
—— ——, Order, 21
—— ——, Period of Contagion, 10, 11
—— ——, Serum Tests for, 15 *et seq.*
Experiments and Education Committee, 82

Farm Competition, 1921, 129
Farming and Reconstruction, 72
Farwell, Major E. W., on Cider Exhibit, 126
Feeding Stuffs, Guide to Purchase, cxxxi
—— ——, How to Sample, cxxxii

Fertilizers, Guide to Purchase, cxxxi
Financial Statements, clxxvii
Fleming, Dr., on Animal Plagues, 3
Forestry Commission, 118
—— Section at Bristol, 117
Free Stocks and Leaf Scorch, 191
Friningham Hardy Stock Farm, 23
Fruit Breeding, 170
—— Crops, Manuring of, 154
Fruiting, Manure as Cause of Failure, of, 152

GARDEN SWIFT MOTH, 68
General Laws, Society's, cxviii
Goats, Awards, lxix
——, Prizes and Judges, clii
——, Milking Competition, 115
Gooseberries, Crossing of Stocks, 172
Grove, Otto, on Cider Making, 252
Guernsey Butter Tests, 112

HARBORD, A., ON FOLDING OF PIGS, ON ARABLE LAND, 22
Harper-Adams College, 33
Heart and Dart Moth, 68
Hollingworth, G. W., on Allotment Competition, 136
Horses, Awards, iii
—— ,Prizes and Judges, cxxxvi
Hunter, C., on Botanical Analysis, 89

IMPROVEMENT OF POOR PASTURES, 82
Inoculation for Abortion, 2
Insect Pests of Strawberries, 57

JERSEY BUTTER TESTS, 112
Journal of Pomology, 50
Judges, Bristol List of, i

LAND RECLAMATION, 80
Laws, General, cxviii
Leaf Scorch, Apples, 153, 159
—— —— on Fruit Trees, 189
Leather Jackets, 64
—— ——, Control of, 65
Lees, A. H., on Reversion in Black Currants, 180
—— ——, on Red Plant Diseases, 183
—— ——, on Logan Beetle, 241
Lipscomb, G., on Forestry Section, 117
Live Stock, Conditions and Regulations, clx
Logan Bettle, Control of, 241
Long Ashton Demonstration Plot, 85, 89
Long, Prof. James, on Farming, 72
Lydney Demonstration Plot, 89

MANURING OF FRUIT CROPS, 154
Marketing of Farm Produce, 79
Massachusetts, Report of Director on Abortion, 2
Members, List of, cxcii
Membership, Privileges, cxxx
——, Terms of, cxvii
M'Fadyean, Sir J., on Serum Tests for Abortion, 15, 16
Michaelmas Daisy Disease, 272
Miles, Herbert W., on Insect Pests of Strawberries, 57
Milking, Awards, xcix
——, Prizes for, clviii
Milk Recording, 130
Millipedes, 70
Mites and Reversion of Black Currants, 237
Moisture and Canker, 269
—— in Soil and Leaf Scorch, 217
Muriate of Potash, Effect on Potatoes, 244

NATIONAL FRUIT AND CIDER INSTITUTE, 52, 84, 121
National Institute for Research in Dairying, 125
Nature Study and Handicrafts, 121
Nauru Phosphates, 83
Nitrogen, Effect of on Leaf Scorch, 161
Nocard's Investigation on Abortion, 7
Nutrient Solution for Fruit, 156

OFFICERS, LIST OF SOCIETY'S, cxxv
Officials, Permanent, cxxvi

PASTURE AND SOILING, 45
Pears, Crossing of Stocks, 171
Pectin, Behaviour of towards Alkalis, 184
Penberthy, Prof. J., on Epizootic Abortion, 1
Peren, G. S., on the Logan Beetle, 241
Perennials Artificially produced, 55
——, Senescence in, 47
Phosphoric Acid as essential to Strawberries, 170
Pigs, Awards, lxxiii
——, Judges and Prizes, cliii
——, Folding of on Arable Land, 22
——, Folding, Crops for, 24
——, Fencing, 27
——, Housing, 26
——, Profits of, 28
——, Hardy Breed of, 23
——, Soiling Crops for, 40
Plant Wounds, Healing of, 53
Plums, Crossing of Stocks, 171
Plymouth Meeting, cxxxiv

Pomology, Journal of, 50
Potash, Effect of on Leaf Scorch, 161, 208
Poultry, Awards, civ
——, Judges and Prizes, clxxi
——, Regulations, clxxiv
President, The Society's, cxxi
Priestley, Prof. J. H., on Senescence in Plants, 46
Produce, Awards, xciv
——, Judges and Prizes, clvi
Pruning, Lorette System of, 154

RASPBERRIES, CROSSING OF STOCKS, 172
——, Disease of, 146
——, Gall Fly, 151
Red Plant Disease of Strawberries, 183
Representatives, Society's, on other bodies, cxxvi
Reversion in Black Currants, 151, 180
Root and Shoot Growth, Comparison, 260
Root Development, Studies on, 257
—— ——, and Leaf Scorch, 209
—— —— and Ringing, 264
Rose Chafer, 60
Royal Agricultural Society, Committee on Abortion, 7

SENESCENCE IN PLANTS, 46
Sheep, Awards, lx
——, Judges and Prizes, cxlix
Shoeing, Awards, c
——, Judges and Prizes, clix
Slugs, 71
Small Holdings, Awards, ci
—— —— Competition, 1921, 134
Soils, Influence of on Leaf Scorch, 195
Soiling-System, 30
——, Advantages of, 31
——, Crops for, 36 *et seq.*
——, Effect on Cattle, 42
——, Milk Yields from, 33
Somerville, A. F., on the Dairy Department, 105
Spinks, G. T., on Fruit Breeding, 170
Storr, F. H., Annual Report, 138
—— ——, on Bristol Exhibition, 99
Strawberry Aphis, 70
Strawberries, Crossing of Stocks, 172
Strawwberries, Effect of Manures on, 167
——, Insect Pests of, 57
——, Red Plant Disease, 183
—— Tortrix Moth, 69
Sulphate of Potash, Effect on Potatoes, 244
Superphosphate and Wireworm, 61
Swansea, 1923 Show, 141

TESTS, MILK AND BUTTER, 106
Thorn Eradication, 97
Thring, Douglas T., on Farm Competitions, 129
Tomatoes, Crossing of Stocks, 173
Tortrix Moth on Strawberries, 69
Trustees, Society's, cxxi
Tuberculosis in Cattle, 2
Turnbull, Gervaise, on the Soiling System, 30
Turner, A. D., on Allotment Competition, 136
Tutin, F., on Pectin, 184
—— ——, on the Chemistry of the Apple, 189

VARIETY IN CROPPING, IMPORTANCE OF, 36
Vegetative Propagation, 48
Vice-Presidents, cxxi
Vine Weevil, 62
Voelcker, Dr. J. A., Annual Report, 275
—— ——, on Thorn Eradication, 97

WALLACE, CAPT. T., ON EFFECTS OF POTASH ON POTATOES, 244
—— ——, Manuring of fruit, 154
—— ——, on Soil Analysis, 84
Weevil Grubs, 62
White, A. R., on Small Holdings Competitions, 134
Wiltshire, S. P., on Canker Control, 269
—— ——, on Leaf Scorch, 189
—— ——, on Michaelmas Daisy Disease, 272
Wireworms, 60
——, Control of, 61
Wootton Fitzpaine Demonstration Plot, 86
Working Dairy, 105

END OF VOL. XVI.

BATH:
PRINTED BY WILLIAM LEWIS & SON. LTD., 12, NORTH GATE.

BREEDERS' DIRECTORY.

HORSES.

Arab

Hough, S. G., Springhouse Park, Theydon Bois, Essex. Stallions and Mares at Stud, including winners at the leading shows

Clydesdales.

Clydesdale Horse Society of Great Britain and Ireland, 93, Hope Street, Glasgow, Archd. MacNeilage. Secretary. Volume XLIV will be published early in 1922. Entries for Volume XLV will close on September 30, 1922. Some previous Volumes of Stud Book on Sale, price 10s. each ; half-price to Members.

Hackneys.

Lort, Eurgain, Castlemai, Carnarvon, North Wales. Breeder of Johnty Southworth Champion Hackney Pony, Royal Show, Cardiff, 1919. For sale, Young Mares and Stallions. Hackney and Welsh Cobs and Ponies. Rare old strain.

Shires.

Pearson, Sir Edward E., Brickendonbury. Hertford Stud Horses : Dollas Empire (34701), Coleshill Forester (24149). Apply, Estate Office, Brickendonbury, Hertford.

Stern, Sir Edward, Fan Court, Chertsey. Stud Horse : Bicester Royalty (35403), by Abbot's Royal Blood. Colts, Fillies, Mares, generally for sale.—Apply, Bailiff, Fan Court, Chertsey, Surrey.

Polo and Riding Ponies.

Mason, F. Ffitch. The Faraam, Killay, Glamorganshire. Breeder of prize-winning Welsh Mountain Ponies. Stallions : Grove Grey Dawn (893), Hawddgar Matchlight (732). Inspection invited. Apply, A. Cooke, Stud Groom.

Shetland.

Shetland Cattle Herd Book Society. Particulars, Secretary, W. Laidlaw M'Dougall, Estate Office, Sumburgh, Shetland.

HORSES—*continued.*

Lloyd, Mrs. S. C. E., Pounds Farm, Lambourne, Berks. Pedigree Shetland Ponies bred from prize-winners. All ages and sizes for sale.

Suffolks.

Blyford Hall Stud of Suffolk Punches. Inspection invited. Mares, Geldings and Stallion for sale. Apply, S. and H. Scrimgeour, Blyford Hall, Halesworth.

CATTLE.

Aberdeen-Angus.

Aberdeen-Angus Cattle. The Premier Beef Breed. Illustrated pamphlets (various languages) recounting record of supremacy in beef production, on application. Secretary, Aberdeen-Angus Cattle Society, 137, Union Street, Aberdeen.

Reid, A. T., Auchterarder House, Perthshire. Breeder of select herd of Aberdeen-Angus Cattle, which includes Ericas, Prides, Georginas, Jilts, Miss Burgess, and Blackbirds. Stock Bulls used in herd : Prince Eric of Bleaton (38512), Evmar (41558), and Black Idol (45093). For particulars, apply to J. McGilchrist, Manager, Home Farm, Auchterarder.

Rosebrae Aberdeen-Angus Herd. Owner, Gordon R. Shiach, of Rosebrae, Elgin. Stock Bulls : Everard II. of Maisemore (winner of ten firsts and five champion medals) and Evermore of Ballindalloch. Females of fashionable families and individual merit.

Scott, C. T., Buckland Manor, Broadway, Worcestershire. Stock Bulls : Etrurian of Bleaton, Champion Royal and Highland Shows, 1919 and 1920 ; Proud George, First and Reserve Champion, Royal, 1919 ; Champion, Bath and West, 1920. Young Bull for sale. Apply, Day, Manager.

Theakston Aberdeen-Angus Herd. Founded 1883. 100 head registered cattle. All the fashionable families represented. Yearling Bulls and Heifers for sale. Ballindalloch Sires. Owner, A. McIntyre, Theakston, Bedale, Yorkshire.

CATTLE—*continued.*

British Friesians.

KNEBWORTH HERD OF BRITISH FRIESIAN CATTLE. Topnote for milk, size, type and fashionable breeding. We invite inspection. Apply, W. and R. Wallace, Knebworth Station, Herts. Station: Knebworth, G.N.R. (25 miles from King's Cross). Telephone: 34, Knebworth. Telegrams: Wallace, Knebworth Station.

Dexters

JOYCE, REV. WALTER, CHARLES RECTORY, SOUTH MOLTON, DEVON. The Exmoor Herd Pure Dexters. Largest in England. Bulls, Cows, Heifers, home-bred (not dealer). Honours, Royal, Bath and West, Smithfield Cup, etc.

Galloways.

BIGGAR, WALTER. Breeder of choicely-bred Galloway Cattle. Those requiring cattle for pure or cross-breeding can be suited reasonably, and special care is given to orders entrusted to me. Grange Farm, Dalbeattie, Scotland.

Guernseys.

PEDIGREE HERD PRIZE-WINNING GUERNSEYS, bred from Island strains. Bulls and Heifers for sale. Mrs. R. C. Bainbridge, Elfordleigh, Plympton, South Devon.

Herefords

BIBBY, FRANK, HARDWICKE GRANGE, SHREWSBURY. Prize-winning Herefords, male and female, always for sale and export. Also Scotch Shorthorns, finest strains. Apply, Bailiff, Hardwicke Grange, Home Farm, Hadnall, Shrewsbury.

MASON, F. FFITCH, THE FARAAM, KILLAY, GLAMORGANSHIRE. Breeder and Exhibitor of high-class Herefords. Eligible for all records.

PYMAN, SYDNEY, PIGEON HOUSE, ROSS-ON-WYE, HEREFORDSHIRE. Pedigree Hereford Cattle. Heifers and Bulls generally for sale.

ROBINSON, STEWART, LYNHALES, KINGTON, HEREFORDSHIRE. Old-established herd, with strong infusion of Hampton Court blood. Sires: Gainsborough, Ringer, One Royal, Resolute, and Mansel Handyman (33954). Inspection invited. Apply S. Robinson, The Ovals, Kington, Herefordshire.

SHUCKNALL COURT HEREFORDS. Owner, Henry Moore, Shucknall, Hereford. Breeder of many Royal and other show winners. Inspection cordially invited.

WALLER, REAR-ADMIRAL CRAIG. ALLENSTOWN, KELLS, CO. MEATH. Pedigree Hereford Cattle. Winners of all champion prizes, Royal Dublin Society Show, 1921. Well-bred Heifers for sale. Station: Ballybeg.

Jerseys.

HENDERSON, HON. LIEUT.-COL. H. G. Pedigree Jersey Herd. Apply, Walter Crosland, Estate Office, Buscot Park, Faringdon.

HOUGH, S. G., SPRINGHOUSE PARK, THEYDON BOIS, ESSEX. Government milk records kept. Tuberculin tested. Young stock and Down Calvers generally for sale. Speciality: Young Bulls from heavy milking strains on both sides.

SADLER, MRS. HAYES, NORSBURY, SUTTON-SCOTNEY. Pedigree Jerseys and Middle White Pigs. Station: Sutton-Scotney, G.W.R., 1½ miles. Telegrams: Sutton-Scotney.

STERN, SIR E. D., FAN COURT, CHERTSEY, SURREY. Herd of Pedigree Jersey Cattle which have passed the tuberculin test. Many prize-winners. Bulls, Cows and Heifers for sale.

WANNERTON JERSEYS. Cows, Heifers, and Young Bulls usually for sale. All passed tuberculin test. Milk records kept. Bulls at present in service: Dappler by The Cid, Italicus by Xenia's Sultan. Apply, A. E. Bond, Wannerton, near Kidderminster.

Kerry.

PALMER, CAPTAIN RICHARD ELLIOTT. The O.P.H. (Registered prefix), Oaklands Park Herd, Newdigate, Surrey. Pure Pedigree, Registered Kerry Cattle, prize-milking, butterfat, record strains, type, breeding. Apply, The Foreman.

CATTLE—*continued.*

Lincoln Reds.

AUBREY, ROWLAND F., WEYBRIDGE. ELLINGTON, HUNTS. Prize-winning herd Lincoln Red Shorthorns. Prizes won 1921 include Firsts at Royal, Peterboro', Northants, Leicester, Hunts. Stock Bulls: Pendley Mascot and Weybridge Pendley Chancellor. First Royal. Station: Huntingdon. Telegrams: Weybridge, Huntingdon.

STAPLEFORD PARK HERD OF LINCOLN RED SHORTHORNS. A few young Bulls for sale, from tested milkers. Apply, C. S. Harvey, Wymondham, Oakham.

WEIGALL, LT.-COL. SIR A. G., K.C.M.G., "PETWOOD," WOODHALL SPA, LINCS. Pedigree Lincoln Red Shorthorns. Dual-purpose Cattle kept. Prizes won: Royal, Lincs County, Peterborough, Oakham, Boston, Alford. London Dairy Show and Smithfield. Apply, Agent, Estate Office. Station: Stixwould. Telegrams: Woodhall Spa.

Red Polls.

BARRACLOUGH, ERNEST, RAMSEY TYRRELL, INGATESTONE, ESSEX. Red Poll Cattle, including notable prize-winners. Telephone: Ingatestone 40.

BROWN, THOMAS & SON, MARHAM HALL, KING'S LYNN. Herd established 66 years; Powell strains predominate; many prizes won at breeding and fat stock shows, including champions, specials and breed cups. Stud Bull: Marham Dauntless (11031), triple champion, R.A.S.E. Daily milk records kept. Stock of all ages for sale.

HUTTON HERD OF PEDIGREE RED POLLS, the property of Mr. C. Pilkington, Hutton Hall, Hutton, Essex. The herd is bred for Milk and Constitution. Sudbourne and Harefield blood predominates. Honours won include 2nd prize and 3rd prize, Milking Trials, and 1st prize Butter Test, London Dairy Show, 1921. Average yield of herd for year ending October 1st, 1921, 8,310lb. of Milk, excluding first-calf heifers. Daily milk records kept. Young Bulls for sale. Inspection invited.

CATTLE—*continued.*

Shorthorns.

EDGE, S. F., PEDIGREE SCOTCH SHORTHORNS. Augusta, Broadhooks, Butterfly, Clippers, Lancasters, Missie. Constitution and good breeding, powers encouraged by ample fresh air and exercise. Young Bulls and Heifers generally available for sale. Inspection welcomed. Gallop's Homestead, Ditchling, Sussex.

GRAHAM-CLARKE, J. E. H., FROCESTER MANOR, GLOUCESTERSHIRE. Scotch Shorthorn Cattle from Augusta, Miss Ramsden, Broadhooks, Charlotte Corday families. Young Bulls for sale

HENDERSON, HON. H. G., LT.-COL. Pedigree Shorthorns of deep-milking strains. Bulls and Bull Calves for sale. Mr. Walter Crosland, Estate Office, Buscot Park, Faringdon.

HOBBS, ROBERT W., & SONS, KELMSCOTT, LECHLADE, GLOS. Herd of 500 Dairy Shorthorns; founded in 1877. One of the oldest and largest pedigree herds in existence. Milk, flesh, and constitution studied. Daily Milk Records kept. Numerous prizes won for Inspection, Milking Trials, and Butter Tests. The Fifty Guinea Challenge Cup for the best group of Pedigree Dairy Shorthorns was won at Darlington, for the fifth successive Royal Show. Bulls and Bull Calves on sale, with prices to suit all buyers. Four Cross Bull Calves at moderate prices, suitable for non-pedigree dairy herds, a speciality. All the cows in milk, and the bulls have passed the Tuberculin Test. Station: Kelmscott, 2 miles. Telegrams: Hobbs, Lechlade.

ROSEBERY, EARL OF, MENTMORE, LEIGHTON BUZZARD. Best strain Scottish Shorthorns. Winner first and reserve champion, R.A.S.E. Bulls and Heifers for sale. Apply, Charles Edmunds, Mentmore, Leighton Buzzard. Station: Leighton Buzzard.

THICKET PRIORY HERD, the property of Lt.-Col. J. A. Dunnington-Jefferson, D.S.O. Bulls of best strains always on sale. Apply to Andrew Moscrop, Thorganby Hall, York.

BREEDERS' DIRECTORY.

CATTLE—*continued.*

THORNTON, FRANK H., KINGSTHORPE HALL, NORTHAMPTON. Pedigree Dairy Shorthorns. Winner of many prizes, including First Prize Milking Trials, Royal Show, 1911, and First Prize Heifer Milking Class and Breeders' Silver Medal, Dairy Show, 1915. Breeder of First and Champion Bull, Royal Show, 1919.

WELBECK HERD OF PEDIGREE SHORTHORNS, the property of the Duke of Portland. Young Bulls and Heifers for sale from the best strains, Apply, Alex. Galbraith, Welbeck, Worksop.

YATES, MAJOR S. P., BROUGHTON GRANGE, BANBURY. Pedigree Dairy Shorthorns. Darlington, Foggathorpe, and other Bates families. Daily Milk Records. Bull Calves by Combebank Victory (a son of Marian IV.) out of deep milking cows, for sale. Stock Bull: Foggathorpe Premier by Playford Premier, out of Foggathorpe Primrose.

South Devons.

ANTONY SOUTH DEVON HERD, the property of Lieut.-General Sir Reginald Pole-Carew, K.C.B. Pedigree herd of deep-milking cattle, including cows of over 1,000 gallons. Dairy milk records kept. Bulls, Cows and Heifers for inspection and sale. Apply, C. G. C. Elers, Antony Estate Office, Torpoint, S.O., Cornwall.

HANCOCK, CHARLES, THE MANOR FARM, COTHELSTONE, TAUNTON. Herd of Devon Cattle. Telegrams and Station: Bishop's Lydeard.

Welsh Black.

LORT, EURGAIN, CASTLEMAI, CARNARVON, NORTH WALES. Hardy, heavy milkers. Choice in-calf Heifers and young Bulls—coming champions—on sale.

MOON, NORMAN L., LLANDRILLO, MERIONETHSHIRE, N. WALES. Daily milk records kept, checked by Ministry of Agriculture Recorder. Splendid selection for sale. Telegraphic address: Llandrillo. Railway station (3 minutes): Llandrillo.

SHEEP.

Oxford Downs.

CASE, MAJOR C. F., COCKTHORPE, WELLS, NORFOLK. Annual Lamb sales, Hempton Green Fair, Kelso Ram Fair. Rams for sale privately.

HOBBS, ROBERT W., & SONS, KELMSCOTT, LECHLADE, GLOUCESTERSHIRE. This Flock was established in 1863, and consists of from 1,000 to 1,250 registered Oxfords. Numerous prizes for many years won at the principal shows. Telegrams: Hobbs, Lechlade.

Romney Marsh.

FINN, ARTHUR WESTBROKE, LYDD, ROMNEY MARSH, KENT. This Flock grazed in Romney Marsh since 1740, has gained first prizes and (twice) reserve for champion Flock, in Ewe Flock competitions. 2,000 registered Sheep can be inspected at any time. Selections for sale.

Ryeland.

RYELAND SHEEP, CLYTHA PARK FLOCK, winners of many prizes in previous years, including four first prizes Herefordshire and Worcestershire Show, 1916, and two First prizes, four Second prizes, and one for wool at Royal Show, Manchester, 1916; winners of First prize best pen five Ewes at Hereford Ryeland Show and Sale, August, 1918. Winners of several Prizes, Royal Show, Cardiff, 1919. Awarded First prize for best Ryeland Flock in United Kingdom, 1919. Shearling Rams and Ram Lambs, etc., for sale. Apply, Manager, Clytha Park, Abergavenny.

Shropshires.

ATKINS, LIEUT.-COL. E. C., STRETTON HOUSE, STRETTON BASKERVILLE, HINCKLEY. Successor to the late A. S. Berry, Shenstone Hall, Lichfield. This renowned prize-winning flock of Shropshire Sheep, established over 50 years, has been taken over in its entirety. Sheep from this flock have been shipped all over the world. Ewes and Rams always for sale. Inspection at any time. Station: Hinckley, L. & N.W.R. and Mid. Rly. Apply owner.

SHEEP—*continued.*

Bibby, Frank, Hardwicke Grange, Shrewsbury. Shropshire Sheep of choicest merit from celebrated prize-winning flock for sale and export. Also Berkshire Pigs. Apply, Bailiff, Hardwicke Grange, Home Farm, Hadnall, Shrewsbury.

Southdown.

Luton Hoo (95), property of Lady Ludlow, established 1870. Highly successful at Royal and leading Shows. 1921 Gold Medal at Royal, Silver Medals Bath & West and Norfolk. W. J. Fleet, Estate Office, Luton Hoo, Luton.

PIGS.

Berkshires

Manuden Herd of Pedigree Berkshires. Boars and Gilts, bred from prize-winners, for sale. Apply, Gee, Manuden House, Essex. Station: Bishops Stortford.

Minley Herd Pedigree Berkshires. Won 1st and 2nd Bath and West, 1st and Reserve Royal Derby for 1921 Pigs; smart Boars and Gilts, all ages, for sale. Bailiff, Minley Home Farm, Farnborough, Hants.

Thicket Priory Herd, the property of Lieut.-Col. J. A. Dunnington-Jefferson, D.S.O. High-class young Boars and Gilts on sale, all of the celebrated Lunn family. Apply to Andrew Moscrop, Thorganby Hall, York.

Essex

Barraclough, Ernest, Ramsey Tyrrell, Ingatestone, Essex. Essex pigs bred from prize-winners.

Gloucester Old Spots

Hobbs, Robert W., and Sons, Kelmscott, Lechlade, Glos. Herd founded with the most reliable and fashionable strains. Stock Boar: Dineford Lawless, purchased for 200 guineas. All sows by Woodstock King, 1st and Reserve Champion at Royal Show, Derby. Young Boars and Gilts on sale.

Mountford, Fredk., Yew Tree Farm, Northfield, Birmingham. Gloucestershire Old Spot Pigs. Winner

PIGS—*continued.*

2nd and 3rd Prizes Royal Agricultural Show, Derby, 1921; also 2nd Oldham; 1st Royal Welsh: 1st Stratford-on-Avon: 2nd Shrewsbury, etc., etc. Boars and Gilts from prize-winners for sale.

Perrett, John Henry, Hill House, Old Sodbury, Glos. Gloucestershire Old Spots. Boars and Gilts. Prize-winning strains. Station: Chipping Sodbury, Glos.

Skeynes Herd Pedigree Gloucester Old Spots. Bred and reared on outdoor system winter and summer. Excellent graziers, very hardy and prolific. Carefully selected stock for sale at moderate prices. B. Walmsley, Skeynes, Edenbridge, Kent.

The Fairfield Herd of Gloucester Old Spot Pigs. Winners to choose from. Gilts, Boars, Sows. Inspection invited. On the main line of the Shrewsbury and Hereford Railway. J. B. Dowding, Leominster.

The Merridale Herd G.O.S. Pigs, the property of George Carter Oliver, Esq., J.P. In-pig Gilts and Boars ready for service, for sale, also younger stock from winning sows (including 1st at Bristol, 1921) by Kingswood Yeoman, Shipley Commander, and Harper Adams Lad. Apply, the Agent, The Elms, Horley, Surrey.

Large Blacks.

A Fine Herd of the best-known Pedigree strains, Bassingbourn, Vahan, Lustleigh, Sudbourne, Trevisquite, Docking, etc., etc., bred in the open on high land and reared under the hardiest possible conditions at Sandy Lane Farm (half a mile from Tiddington Station, G.W.R., and less than two hours from Paddington), the Pigs of this magnificent herd are well worth studying. Gilts and Boars at moderate prices. The Haseley Herd of Large Black Pigs. Write for particulars or appointment to view to Captain Wilfrid Bruce, C.B.E., Haseley Manor, Wallingford, Oxon.

Bainbridge, Mrs., Elfordleigh, Plympton. Foundation from Corn-

BREEDERS' DIRECTORY.

PIGS—*continued.*

wood Herd Boars and Gilts from choice winning blood on sale. Apply Steward, Home Farm.

Birchen Herd. Out in all weathers; reared in the open. Typical, hardy, prolific. Stock of all ages for sale at reasonable prices. J. Errington, The Orchards, Battle, Sussex.

Bixley Herd of Pedigree Large Black Pigs. For sale Boars all ages, well grown, hardy, and bred from noted winners. Apply, Stanley A. Stimpson, Bixley, Norwich.

Blyford Hall Herd of Large Black Pedigree Pigs, hardy and prolific, from best strains. Boars and Gilts for sale. Apply, S. and H. Scrimgeour, Blyford Hall, Halesworth.

Douglas Herd of Pedigree Large Black Pigs. True to type. Specially adapted for export; wonderful results in tropical and sub-tropical countries. Address Proprietor: Loudon MacQueen Douglas, 29, West Savile Terrace, Edinburgh.

Edge, S. F., Vahan Herd Pedigree Large Blacks. Royal Champion and other show winners. Reared on open-air system on heavy Weald clay. Out winter and summer, will thrive anywhere. Hundreds to choose from. Inspection invited. Gallops Homestead, Ditchling, Sussex.

Kilworthy Herd Typical Large Black Pigs, founded almost entirely on Cleave blood. The matron of my herd is a splendid Fentongollan sow got by Cleave Fentongollan That's Him, and I have a lot of her daughters by Cleave Masterpiece. My stock Boar is a Cleave pig. J. D. Leman, Kilworthy, Tavistock.

Large Black Pigs, Pedigree, kept on grass. Boars and Gilts, prices reasonable. Pedigree Guernseys, White Turkeys, White Wyandottes sittings and stock birds. Currie, Mayfield, Sussex.

Norman, Arthur & Son, Hill Vue, Lolworth, Cambridge. Large Black and Large White Pigs. Bred and reared in open. Boars and Gilts always for sale. All bred from best prize-winning blood, including Royal winners. 'Phone: Madingley 4, Station: Cambridge.

PIGS—*continued.*

Pearce, E. W., The Cross Roads, Whittington, Lichfield. Large Black Pigs. Boars and Gilts, descended from Champion Royal winners for sale. Prices reasonable. Stations: Lichfield City and Trent Valley, two miles.

The Aldhelm Herd contains some of the best blood in England, including Treveglos, Trevesquite, Fentongollan, Cornwood, Drayton, Sudbourne Valley, Bixley, etc. Open air, arable system only employed. Young stock usually available at reasonable prices. Apply, Major C. T. Holland, Lea House, Malmesbury, Wilts.

The Hillesden Herd Pedigree Large Blacks. Gilts and Boars for sale. J. C. I. Haynes, Hillesden, Buckingham.

Tinten Herd of Pedigree Large Black Pigs. One of the oldest in the West of England. None but the best kept. Championships won at the Royal and other leading Shows. Inspection invited. Harry E. Bastard, Tinten Manor, St. Tudy, Cornwall.

Saxon Herd Pedigree Large Black Pigs. Bred from champion strains. Running out winter and summer. Young stock always for sale at reasonable prices. Interested visitors welcome. Pupils taken. Llewellyn Lewis, Henfield Farm, Scaynes Hill, Haywards Heath, Sussex.

Large Whites.

Greenall, Sir Gilbert, Bart., C.V.O., Walton Hall, Warrington. Walton and Worsley Herd Pedigree Large White Pigs. Since the purchase of the Worsley Herd from the late Earl of Ellesmere in 1913, Championships have been awarded at each Royal Show. Inspection and enquiries cordially invited. Apply to The Manager, The Office, Bridge House, Higher-Walton, near Warrington.

Hough, S. G., Springhouse Park, Theydon Bois, Essex. Herd kept on open grazing systems. Young Boars and Gilts always for sale.

BREEDERS' DIRECTORY.

PIGS—*continued.*

Kirby Bedon Herd Pedigree Large White Pigs. Grand young Boars and Gilts at moderate prices. Hardy constitution, size, and bone. W. Mitchell, The Vale, Kirby Bedon, Norwich.

Longnor Herd of Pedigree Large White Pigs. Foundation stock obtained only from leading Champion Herds and reared on the open-air system. Boars and Gilts for sale. Major Corbett, Longnor Hall, Shrewsbury.

The Ramsey Herd of Large White Pigs. If you want the best come to the Herd that Breeds them. The property of J. I. Major, Ramsey, Huntingdonshire. Telegrams: Major Ramsey, Hunts.

Middle Whites.

Cropwell Old-Established Herd of Choice Pedigree Middle Whites. Size, health, quality, early maturity. Out winter and summer. Prices always moderate. Cuthbert C. Smith, Cropwell Butler, near Nottingham. Bingham Station (G.N.).

Edge, S. F., Albany Herd Pedigree Middle Whites. Herd started from Champion Strains. Bred on open-air system. Out winter and summer on Weald clay. Marvellous constitutions, wonderful doers and breeders. Hundreds to choose from. Gallops Homestead, Ditchling, Sussex.

Wild, Major C. H., South Ash Manor, Wrotham, Kent. Pedigree Herd Middle White Pigs from the best strains. A few good Boars and Gilts for sale. Station: Fawkham. Telegrams: Ash, Wrotham.

Peel, Mrs. John, Peover Hall, Knutsford, Cheshire. Pigs bred and reared entirely in open. Prize-winning and prize-bred stock for sale.

Prestwood Herd of Middle White Pigs, owned by W. B. Hill, Wednesfield, Wolverhampton. Boars and Gilts of choicest breeding from winners at principal shows always on sale. Of hardy constitution; kept out on grass; will thrive anywhere.

PIGS—*continued.*

Ramvan Herd Middle Whites. Noted strains, moderate prices. N.P.B.A. points strictly adhered to; anything below this high standard goes to pork. Newbold & Johnson, Shelley Plain Farm, Crawley, Sussex.

Skeynes Herd Pedigree Middle White Pigs. Bred and reared on outdoor system winter and summer. Very hardy and prolific. Carefully selected stock for sale at moderate prices. B. Walmsley, Skeynes, Edenbridge, Kent.

Stapleford Park Herd of Middle White Pigs. A few Gilts and Boars from carefully selected stock. Sired by Royal winners. Apply, C. S. Harvey, Wymondham, Oakham.

The Wharfedale Herd of Pedigree Middle White Pigs. Royal Show, Derby: Challenge Cup for best specimen of Breed; Championship for the best animal in female classes; Reserve Championship for the best animal in male classes; also three 1st Prizes. Won Championship 1908, 1909, 1910, 1913, 1914, 1915, 1919 and 1921. And 1st Prize for pen of three Gilts at 11 successive Royal Shows. Well-known characteristics of the Herd are true type and fine quality, combined with size and sound constitution. Prompt and careful attention to all enquiries and orders. Prices always reasonable. Apply, Leopold C. Paget, Middlethorpe Hall, York.

Wychwood Forest Herd of Pedigree Middle Whites. Open-air system. Leading strains. Owner, Captain the Honble. Bertram Mitford, D.S.O., R.N., Mill Cottage, Swinbrook, Burford, Oxfordshire. Station: Shipton (G.W.R.).

POULTRY.

Buff Orpingtons

Dalton Holmes, Mrs. Gold and Silver Medal Buff Orpingtons for Winter Eggs, 10/6, 12/6, 15/6 sitting. Also Snowdon-Barron, White Wyandottes 12/6, all unfertiles replaced. East Markham Hall, Newark.

POULTRY—*continued.*

Dorkings.

Major, Arthur C. Breeder and Exhibitor thirty years. Champion Dark and Silver Grey Dorkings, "England's best fowl." Prizes at all shows. Birds exported all over the world. Prices moderate. Arthur C. Major, Ditton, Langley, Bucks.

Various.

Hough, S. G., Springhouse Park, Theydon Bois, Essex. Houdan, White Wyandotte, Rhode Island and Buff Orpington Poultry, Buff Orpington and Fawn Runner Ducks, Toulaise Geese and Guinea Fowls.

Hearnshaw, Roger Fletcher, Foxhill, Burton Joyce, Notts. Breeder record pedigree laying White Wyandottes and White Leghorns. Also exhibition Black Rosecomb and Scotch Grey Bantams. Birds and Eggs for sale. Send for Price List.

Indian Game.

Birch, Alfred, Sefton, near Liverpool. Breeder of Indian Game and Indian Game Bantams. Winner of over 300 prizes last year, including seven 1st Prizes at the Crystal Palace and the 30-guinea Champion Challenge Shield, the Poultry Club 60-guinea Challenge Trophy for the best Cock or Cockerel, the International Trophy for the best Indian Game, the Poultry Club silver medal for the best Cock in the show, special for the best Indian Game Bantam, and five other special prizes. Station: Seaforth. Telephone: Crosby 110. Telegrams: "Immunity," Liverpool.

Turkeys.

Harper, Gage, Mason's Bridge, Raydon, Hadleigh, Suffolk. Breeder, Exhibitor and Exporter Mammoth Bronze Turkeys. Cock Turkeys always on sale. Eggs in season. Inspection invited. Telegrams: Harper, Hadleigh, Suffolk.

GOATS.

Anglo-Nubian and Swiss

Skidmore, Miss, Ashley Leigh, Box, Wilts. Anglo-Nubian Swiss and Swiss Goats, Goatlings and Kids for sale. Good milkers. Box Station.

MISCELLANEOUS.

Knepp Castle Pedigree Farms, property of Sir Merrik R. Burrell, Bt. Best prize-winning strains of dual purpose Red Polls, Percherons, Large Black Pigs, Light Sussex Fowls and White Runner Ducks. Inspection welcomed. Moderate prices. Apply, Estate Office, Knepp Castle, Horsham. Telegrams and Station: West Grinstead.

AUCTIONEERS.

German, Stevenson & Stimson, Ashby-de-la-Zouch. Agricultural and General Auctioneers. Tenant Right, Timber, Probate and Estate Valuers. Important Weekly Sales of Live Stock at the Ashby-de-la-Zouch and Swadlincote Markets. National Telephone: 66. Telegrams: Stevensons, Ashby-de-la-Zouch. Partners: Frank C. Stevenson, Swepstone, Leicester; Alfred Stimson, Ashby-de-la-Zouch; W. C. Stevenson, Swepstone, Leicester.

Hall, Wateridge & Owen. Agricultural and General Auctioneers, Land Agents and Valuers. Smithfield sales. Offices at Shrewsbury, Wem, and Oswestry. Proprietors of the Raven Horse Repository, Shrewsbury. List of properties free on application. Head Office: Shrewsbury. Telephone: 45.

Leaver, C. D'A. Representative National Provincial and Union Bank of England, Biggerstaffs' Branch, 59, West Smithfield, London, E.C.1. All arrangements made for Export Pedigree Live Stock; Shipments and Insurances effected. Pedigree animals of every description selected and purchased on commission.

Lincolnshire Stock Auctioneers and Agents. Dickinson, Riggall and Davy, Agricultural Auctioneers, Valuers and Estate Agents. Specialities: Supervision of Estates, Sales of Properties, Lincoln Red Shorthorns, and Longwool Sheep. Markets and sales. Offices: Louth, Grimsby, and Brigg.

Waters & Son, Auctioneers and Valuers, Salisbury. Office of Hampshire Down Sheep Breeders' Association. Treasurer: James E. Rawlence. Secretary: W. J. Wooff.

BREEDERS' DIRECTORY.

AUCTIONEERS—*continued*

White & Sons (James A. White F.S.I., F.A.I.), Auctioneers, Land and Timber Surveyors, Agricultural and General Valuers, Estate and Tithe Agents, 18, High Street, Dorking, Telephone: 85 Dorking.

Woodhams & Son, James. Established 1860. Auctioneers, Valuers, Land and Estate Agents. Proprietors of Battle Fortnightly Cattle Auction Market. Particulars of all available farms on application. Offices 27, High Street, Battle.

STAPLEFORD PARK HERD OF

MIDDLE WHITE PIGS.

Sired by Royal Prize Winners

A few choice Gilts and Boars always on Sale at Reasonable Prices

C. S. HARVEY,

WYMONDHAM, OAKHAM

'BP' FUEL

is the secret of Efficient Power Farming

USE

'T.V.O'

Tractor Vapourising Oil which is specially blended for tractor engines.

USE

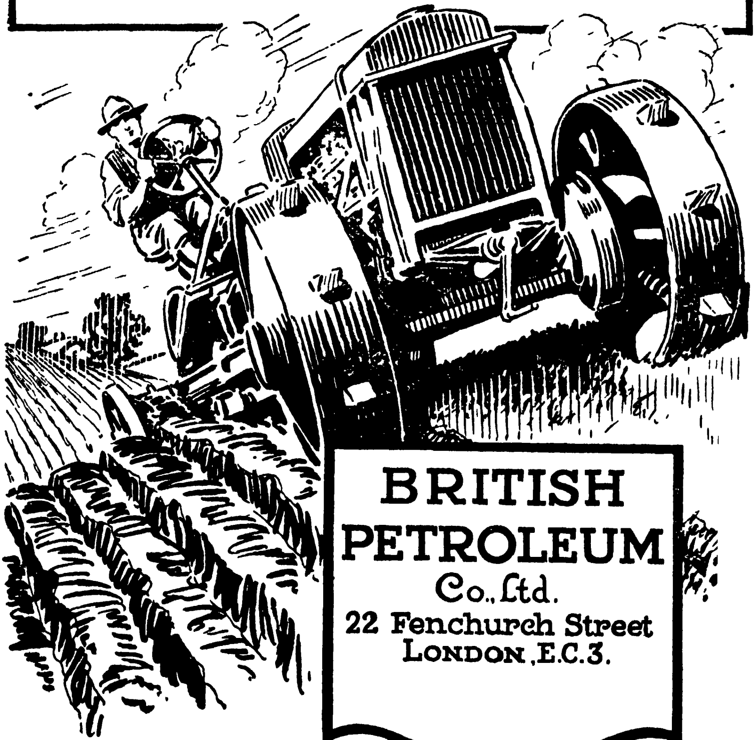
'B.P'

The high efficiency motor spirit for quick, easy starting.

USE

'P.V.O'

Vapourising oil which is specially suitable for stationary oil engines.



BRITISH PETROLEUM
Co., Ltd.
22 Fenchurch Street
LONDON, E.C.3.

IMPERIAL
HOTELS,
RUSSELL SQUARE,
LONDON

7 HOTELS, 2,000 ROOMS

BEDROOM, FITTED H. & C. WATER,
BATH AND BREAKFAST,

FROM 7/9

CENTRAL FOR STATIONS, SHOPS,
THEATRES, MUSEUMS AND TUBES.

Cable Address— Piggott, London " A B C Code (5th Edition) Telephone—London Wall 4850 (4 lines)

PIGGOTT BROS. & Co., Ltd.

Contractors for upwards of Sixty Years to the Bath and West and Southern Counties Society.

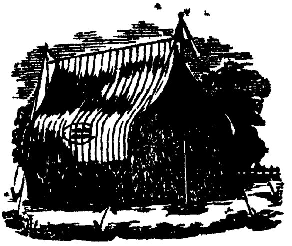
PIGGOTT'S RICK CLOTHS.

All Rick Cloths made up full size.

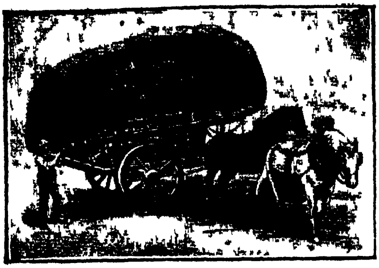
Size	Heavy Jute Tarpaulin.	Hemp Canvas.	Green or Grey Proofed Canvas
8×5 yds	5 10 0	9 12 6	12 2 6
8×8 yds	7 15 0	12 19 6	16 4 9
10×8 yds	9 15 0	16 12 6	20 7 6
10×10 yds	12 2 6	20 5 0	25 9 0
12×10 yds	14 10 0	24 17 6	30 12 6

Samples on Application

RICK POLES AND HOISTING TACKLE—Prices on application



Piggott's Tarpaulin and Waterproof Canvas Waggon Covers.



All fitted with strengthening patches, eyelets and best hemp lines Lettering Tarpaulin and Waggon Sheets 3d per letter

Best Quality Black Dressed Flax Canvas 9×9ft, 36/- 12×9ft 48/- 15×9ft 60/- 18×12ft 96/- 21×15ft 140/- 24×18ft 192/-

2nd Quality 9×9ft 30/9 12×9ft 42/- 15×9ft 51/3 18×12ft 84/- 21×15ft 119/9 24×18ft 164/-

Green Proofed Canvas 1st Quality 9×9ft 45/- 12×9ft 60/- 15×9ft 75/- 18×12ft 120/- 21×15ft 175/- 24×18ft 250/-

2nd Quality 9×9ft 39/- 12×9ft 52/- 15×9ft 64/9 18×12ft 102/- 21×15ft 151/9 24×18ft 203/-

PIGGOTT'S SACKS

Prices subject to Market Fluctuations

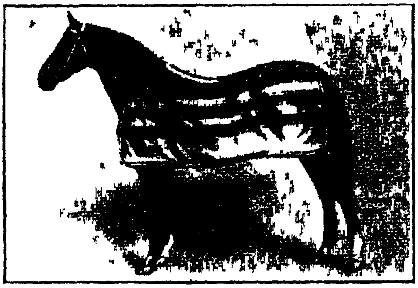
CORN SACKS		each
8 per 4 lbs 4 bush 27		1 9
8 per 4 lbs 4 bush 27	33	2 3
10 per 4 lbs 3 bush 27	44	2 8
10 per 4 lbs 4 bush 27	[illegible]	3
10 per 4 lbs 4½ bush 27	56	3 3

BRAN OR CHAFF BAGS	each
20 oz 8 B	1/
24 oz 8 B	1/3
28 oz 8 B	1 8
30 oz 8 B	1 11

HEMP CART NETS—Ordinary Quality
6 thread, 6×5 ft 7/- 7½×5½ft 9 9
8½×6ft 11/8

SPARROW AND RABBIT NETS,
GREENHOUSE SHADING,
GARDEN NETTINGS

Prices on application.



Piggott's Horse Clothing, Horse Slings, &c —HORSE CLOTHS

	4' 9"	5' 3"	5' 6"	5' 9"	6'
Plain Sacking Horse Rugs lined Check with Surcingle		—	16/3	16/9	17 6
Best Plain Sacking Horse Rugs, lined Heavy Check, with Surcingle	—	—	17/6	18 3	19/-
Stout Combination Cloths, Striped or Plain	18/9	21/3	21/9	22/6	23 3

SURCINGLES 3in to match Rugs, 2/8 4in, 4/6

220, 222, 224, 226, BISHOPSGATE, LONDON, E.C.

I. A. R. I. 75.

IMPERIAL AGRICULTURAL RESEARCH
INSTITUTE LIBRARY
NEW DELHI.

Date of issue.	Date of issue.	Date of issue.